The Builder.

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ILLUSTRATIONS.

Design for a Town Church (Medal of Merit, Soane Medallion Competition, 1903) ..... By Mr. F. C. Mears.
Parish Church, Stonehouse ..... Mr. Alex. Cullen, F.R.I.B.A., Architect.
School, Knowle, Bristol ..... Mr. H. Dare Bryan, Architect.
School, Creswell ..... Messrs. Brewill & Baily, Architects.
Stable, Harrow Weald ..... Messrs. Forsyth & Maule, Architects.
Whitton Court, Salop ..... Mr. H. E. Farmer, F.R.I.B.A., Architect.

Blocks in Text.

Doorway, South Wing, Cobham Hall ..... Page 241
Doorway, Newgate Prison ..... „ 242
Schmetter-Haus, Troppau, Austria. Herr Rudolf Smetz, Architect „ 247
Stonehouse Church.—Plan ..... „ 249
School, Knowle, Brist.l.—Plan ..... Page 250
Alterations to Infants' School, Creswell.—Plan ..... „ 251
Whitton Court, Salop.—Plan ..... „ 252
Illustrations to Student's Column ..... „ 253

CONTENTS.

Fiscal Policy and Building 239
Old English Doorways 240
Notes 242
Letter from Paris 244
Architectural Societies 245
Cement Joints in Drains and Drain-Testing 245
Competitions 245
Experiments in Sewage Treatment at Sheffield 245
Schmetter-Haus, Troppau 247
Books: William Dyson Wansbrough's "The Proportions and Movement of Slide Valves"; Perry F. Nursey's "Society of Engineers Transactions for 1902"; C. T. Millis's, "Technical Arithmetic and Geometry, for Use in Technical Institutes, Modern Schools, and Workshops"; Philip R. Bjorling, C.E. and Frederick T. Glasing's "The Technical Dictionary-Cyclopædia"; W. S. N. Knight's "The Business Encyclopædia and Legal Adviser"; H. Francklin's "Utility Fowl-houses and their Appliances;" J. W. Thomas's "The Ventilating, Heating, and Management of Churches and Public Buildings"; George P. Merrill's "Stones for Building and Decoration" 248
Illustrations:—
Design for a Town Church 249
Parish Church, Stonehouse, Lanarkshire 249
Wells-road Board School, Bristol 249
Creswell Infant School 250
Stable at Harrow Weald 250
Whitton Court, Salop 250
Books Received 249
Correspondence:—
The Gaiety Theatre—Vanishing London 250
A Monument to the Stone Family 250
The Student's Column 250
Obituary 253
General Building News 253
Foreign 254
Miscellaneous 255
Capital and Labour 256
Patents of the Week 256
Meetings 256
Recent Sales of Property 256
Prices Current of Materials 257

Fiscal Policy and Building.

THE question of a change in the fiscal policy of the country, which has recently been placed before an astonished public, is one which should be decided with reference to the general good of the whole community. *Salus populi suprema lex* is the cardinal maxim of social government, and it is to the rule of the majority to which in the long run in every modern community we must all submit. In consideration, therefore, of the fiscal question, this elementary point should be always borne in mind, since there naturally is a tendency for a man who is making his livelihood by some kind of business to favour or oppose a change solely from the point of view of his own business interests.

So far as the general good of the community is concerned we have no manner of doubt that Great Britain and Ireland have benefited enormously by the Free Trade system introduced by Sir Robert Peel in 1846, a change which indeed was inevitable, having regard to the dependance of these islands on imports. One of the most fallacious of assertions at the present time is that the United States have benefited by Protection. The United States is a union of various countries, of different States, within which is the most perfect Free Trade, and had that Free Trade been extended, so as not to exclude except under high duties the productions natural and artificial of other countries, the United States would have thriven even more than from natural causes they have hitherto done.

Coming, however, from generals to particulars, it is not unimportant at the present time to consider in what way building—as we will, for the sake of brevity, call all operations and interests connected with the erection and repair of structures, houses, and so forth—would be influenced by a change from Free Trade. The first point which is clear is that if food is to be taxed—and bread being the staff of life, the foundation of all family sustenance, the relieving of any other article from taxation cannot make up for the taxing of bread—wages must be higher. The moment, however, that in the building trade wages are raised, there is a general raising of expense to the rest of the community, for if it costs more to build a house the rent of that house must be raised and so with everything else. A rise in wages also in all probability would tend to a diminution of work, for it is an undoubted fact that the community unless their wealth increases must economise in some way or other, and one way of economising is to spend less on building. Therefore, from this point of view, Mr. Chamberlain's proposals would be very disastrous alike to the building trade and the general public. The building trade has nothing whatever to gain by any diminution of the import duties on English goods in the Colonies, and it would appear that the first interest of this trade is to hold fast to Free Trade.

Free Trade, by stimulating the import of raw materials in the shape of wood and cement, has certainly been of great benefit to the general community and to the building trade. In 1901 there were imported, for the seven months ending July 31, into Great Britain 103,330 loads of hewn wood from the United States. In 1903 this quantity had risen to 108,521 loads for the same period of time. This compares with 31,458 and 26,682 from Canada, and 22,317 and 27,892 from the British East Indies. These figures are given only by way of example; the complete details can be seen in the table on the next page.

We will now turn to another side of this question, namely, the prices of these articles. The accompanying table (Report on Wholesale and Retail Prices in the United Kingdom in 1902. Board of Trade, August, 1903, p. 201) is very significant. It will be observed that ever since 1861 there has been a steady diminution in the average values of imported timber. In other words, freedom from tariff duties has happily caused this country to be the market to which all the wood-producing countries of the world have sent their stuff. Norway, Sweden, Germany, Russia, and the United States have happily "dumped" their wood in this country. We give the table without further comment: a sensible man can consider and reflect on it for himself, but he should also bear in mind that all the imports of timber assist the prosperity of our shipping and of our seaports.

FIR (HEWN AND SAWN).

(Based on the *Annual Statements of Trade of the United Kingdom*. From 1861 to 1870 the figures are based on the "Computed Real Values"; after that period, on the "Declared Values.")

Year.	Average Value per load of 50 cubic feet.		Year.	Average Value per load of 50 cubic feet.	
	Hewn.	Sawn.*		Hewn.	Sawn.*
	£	£		£	£
1861	3·37	3·07	1882	2·14	2·66
1862	3·27	3·08	1883	2·07	2·49
1863	3·19	3·02	1884	1·84	2·34
1864	3·09	3·01	1885	1·79	2·32
1865	2·86	3·06	1886	1·58	2·20
1866	2·72	2·86	1887	1·49	2·10
1867	2·72	2·70	1888	1·59	2·24
1868	2·73	2·66	1889	1·77	2·50
1869	2·87	2·68	1890	1·63	2·35
1870	2·94	2·72	1891	1·50	2·14
1871	2·45	2·32	1892	1·50	2·18
1872	2·51	2·50	1893	1·40	2·14
1873	2·72	3·15	1894	1·34	2·17
1874	2·77	3·36	1895	1·36	2·09
1875	2·42	2·86	1896	1·42	2·20
1876	2·45	2·88	1897	1·44	2·35
1877	2·39	2·99	1898	1·47	2·35
1878	2·09	2·57	1899	1·45	2·42
1879	1·82	2·25	1900	1·54	2·79
1880	2·07	2·66	1901	1·46	2·56
1881	2·09	2·59	1902	1·37	2·55

Note.—The values of the Imports represent the cost, insurance, and freight; or, when goods are consigned for sale, the latest sale value of such goods. They do not include Customs duty, which, until repealed in 1866, was 1s. per load on hewn and 2s. per load on sawn wood.

* Including "Split, Planed, or Dressed."

Bricks, which are, of course, so essential for building, appear to be imported in such small quantities as not to be set out separately in the returns of imports. But as regards price, we find that they rose from 22s. 6d. per 1,000 in 1863 to 35s. in 1873, and fell to 22s. 6d. in 1883, rose to 25s. in 1893, and in 1902 stood at the same figure. Therefore, but for the fall in the price of

Accounts Relating to Trade and Navigation Issued by Board of Trade, July, 1903.

	QUANTITIES.					
	Month ended July 31.			Seven Months ended July 31.		
	1901.	1902.	1903.	1901.	1902.	1903.
II.—RAW MATERIALS AND ARTICLES MAINLY UNMANUFACTURED—*contd.*						
D. WOOD AND TIMBER:						
Hewn—Fir, Oak, Teak, &c. (other than Pit Props or Pit Wood) From Russia ...*Loads*	43,068	40,956	54,507	132,172	117,075	121,416
„ Sweden... „	2,664	7,136	2,604	12,956	17,625	17,208
„ Norway .. „	6,697	4,642	9,307	33,704	38,729	43,602
„ Germany. „	15,170	12,597	11,223	135,496	93,855	103,873
„ United States of America. „	18,029	24,325	23,870	103,330	106,333	108,521
„ British East Indies... „	2,569	4,249	5,282	22,317	26,383	27,892
„ Canada ... „	12,558	18,114	11,867	31,458	32,510	26,682
„ Other Countries „	904	2,045	3,736	14,287	17,276	15,230
Total... „	102,559	114,646	122,396	485,720	449,777	464,424
Hewn: Pit Props or Pit Wood.....*Loads*	175,178	201,955	211,319	1,096,000	1,094,385	1,204,911
TOTAL of Wood Hewn..... „	277,737	316,601	333,715	1,581,720	1,544,162	1,701,335
Sawn or Split,[1] Planed or Dressed... From Russia ...*Loads*	425,421	468,466	348,581	791,603	778,718	703,457
„ Sweden... „	319,295	282,404	210,463	855,410	707,743	714,995
„ Norway .. „	39,438	43,400	45,406	304,920	330,502	335,044
„ United States of America. „	97,612	86,779	71,771	410,917	342,813	424,797
„ Canada ... „	286,351	302,623	262,266	682,670	641,438	593,932
„ Other Countries „	23,427	29,606	34,769	97,546	98,749	147,696
Total... „	1,191,544	1,213,278	973,956	3,143,066	2,899,963	2,919,921
Staves of all dimensions .....*Loads*	19,466	15,115	11,111	63,846	56,026	62,646
Furniture Woods, Hardwoods, and Veneers:						
Mahogany..... *Ton*	4,196	2,619	7,736	35,876	32,129	43,030
Other Sorts ..... „	26,324	21,532	17,162	150,081	130,913	98,268

wood, building operations would have become even more costly than they have.

As regards furniture and cabinet warehouse frames, fittings, and joiners work, the import of these, taking them together, came in value for the seven months of 1901 to 708,187*l.*, to 684,519*l.* in 1902, and to 714,487*l.* in 1903. These figures show the imports of this kind of article to be somewhat stationary, at any rate not to increase in proportion to the population. But we take it that this simply means that much imported and unmanufactured wood is worked up into the necessary articles and shelves in this country. Next we come to cement for building and engineering purposes. Here we find that the quantities imported for the seven months of 1901, 1902, and 1903 were 111,729, 144,272, and 155,944 tons, and that the averages per cwt. were—1863, 2·32s.; 1873, 3·04s.; 1883, 2·31s.; 1893, 1·70s.; 1903, 1·72s. Here, again, Free Trade has obviously benefited the building trade and the general community. Mr. Chamberlain has endeavoured to alter the business state of England without any public demand. All the facts of our national life, more especially the ease with which the taxation necessary to carry on the South African war was borne, show that the country is in a highly prosperous state. Difficulties in trade from time to time must necessarily arise, and we cannot all make fortunes; but at no time in our history was there less reason to seek to change our fiscal system, which, so far as building is concerned, can only be altered to the detriment of employers, employed, and the general community.

OLD ENGLISH DOORWAYS.

In almost all schools of architecture the entrance to a building has naturally been the most important external feature of the design, and the one most emphasised by decorative treatment. It is the point of connexion between the external and the internal architecture, both in a practical and æsthetic sense. After the spectator has considered the exterior sufficiently, and wishes to enter the building, he naturally expects to find the entrance prominently pointed out by its architectural treatment. There are two principal means of doing this; either by placing the entrance in the base of some important addition to the building, such as a tower; or, if the entrance be made in flat of the exterior wall, by surrounding it with an enriched architectural framing. The former method is in general the most suited to the expression of a large public building. In the Houses of Parliament, for instance, the Victoria Tower is really the architectural expression of the State Entrance; an idea which was happily adopted by one of the competitors in the recent Liverpool Cathedral competition, who placed the tower and spire near the choir, as marking the Bishop's state entrance; and the use of a tower to mark the main entrance has been a common treatment in modern Town Hall designs. The special architectural decoration of the doorway itself may of course be combined with this. The decorative treatment of the doorway in the flat of the exterior wall is more expressive of the character of a private residence, where (except in the very largest class of mansions) an entrance tower would appear rather ostentatious.

The position of the entrance with reference to the whole building is also to some extent indicative of the plan and character of the interior. An entrance placed symmetrically in the centre of the façade leads to the conclusion that the planning of the interior is on a stately and symmetrical principle; a side or angle position of the entrance indicates the contrary. Of late years there has been rather a tendency to the use of angle entrances in town buildings, and in a business building an angle entrance has certainly the advantage of commanding two lines of street, but it generally means some degree of awkwardness in the planning of the interior. For a private house, whether in town or country, an entrance placed on the angle is perfectly unsuitable; it destroys repose and suggests only a misplaced ingenuity in planning.

During the Elizabethan and Renaissance periods in England a great deal of attention was bestowed on the architectural emphasising of the entrance, and there are many fine and interesting examples from buildings of those dates—private houses especially—which afford, if not examples for imitation, at all events excellent suggestions on which to base further developments: for this is the light in which they ought to be regarded. Unfortunately the use made of them in the architecture of to-day is too much in the way of mere imitation. A collection of a number of examples of English doorways of the period just referred to, such as that which has been made by Messrs. Davie and Tanner,* forms an interesting and, in a sense, a useful book; but its true usefulness depends on the spirit in which it is used. All which is old is not therefore admirable. For example, what Mr. Tanner calls "the charming little doorway from Weekly Hospital in Northampton," of which a sketch is given on p. 17, does not merit such a description at all; it is a kind of thing of which one would make a sketch because it is odd and (as an old thing) picturesque; but looked at in the dry light of criticism, apart from antiquarian considerations, it is really an incongruous medley of bad and clumsy detail, some parts quite out of scale, too, with the others; if it were done by a modern architect it would be called vulgar. Now the entrance to Montacute House, sketched on p. 13, is really an admirable and refined bit of architectural design; and to give these two, within two or three pages of each other, as if they were both almost equally worthy of notice, shows a want of critical perception, and is mischievous to the mind of the young student who may get hold of the book, and who is thus encouraged to judge of examples by their date and not by their intrinsic worth. That is the mischief

* "Old English Doorways, from Tudor Times to the End of the Eighteenth Century." By W. Galsworthy Davie and H. Tanner, jun., A.R.I.B.A. London: B. T. Batsford. 1903.

Fig. 1.—Doorway, South Wing, Cobham Hall.

of the modern antiquarian attitude of architectural criticism, that things are taken as right because they are old; and we shall never arrive at any sound comparative view of ancient and modern architecture until we get rid of that mistake, and learn to criticise ancient architecture as we should criticise it if it were modern.

It is in this spirit that we have turned over the examples of doorways illustrated in this book. The responsibility of the two authors, as we gather from the title-page, is thus divided: the separate plates are collotypes from photographs taken by Mr. W. Galsworthy Davie; the historical and descriptive notes, with the sketches in black and white, are by Mr. Tanner. With the general tendency of the remarks and commentaries in his introductory essay we are quite in sympathy; and two points we may particularly mention for approval. The one is the importance which he attaches to the architectural effect of external steps in connexion with an entrance. The flight of steps, often a double one, to the external entrance of the rather high ground floor of the typical seventeenth and eighteenth century house, gives an architectural dignity to the entrance which hardly anything else can compensate for in their absence; and even the lower but widely spread steps, as seen at Raynham Hall, are of value as an effective base to the doorway. The old-fashioned raising of the ground floor to a high level reached by a flight of steps had the advantage, also, of leaving a much better-lighted and more useful basement story than in a modern house where the ground floor is but little raised above the ground level. All this is done away with now by the modern desire for making ourselves so exceedingly comfortable, and our dread of exposure to weather; to have to ascend a flight of exterior steps from your carriage in the rain, with the inevitable umbrella, is a thing not to be thought of; and so instead of the beautiful flight of steps we have the ugly excrescence of the so-called *porte-cochère* ("carriage-porch" would be the more correct term, or *portique-cochère*, if people must have French), one of the most ungainly additions that can be made to a house. Comfort is no doubt gained by it for a self-indulgent generation, but at a loss of architectural dignity which is hardly compensated for. Mr. Tanner also rightly gives some examples of plans, as showing different positions of the entrance door and the reasons for them, without which the subject could hardly be completely considered.

In regard to the Renaissance character of many of the doorways of seventeenth-century houses, the author remarks—

"A very noticeable fact with regard to many entrance features of the houses built about the beginning of the seventeenth century is their elaboration as compared with the simplicity of the rest of the building, which, as a whole, retained a great deal of the Tudor feeling; while in the doorways, which were almost invariably treated with some adaptation of the orders, we find the most evidence of the progress of the Renaissance."

The entrance erection on the north wing at Cobham, plate 9 in the book, is cited as an instance of this. But is this elaborate erection on the background of a brick wall with plain mullioned windows really coincident with the body of the house, and not a slightly later addition? The answer would depend, of course, on a close examination of the stonework; but in this and other similar cases, where the entrance architecture differs so decidedly from that of the rest of the house, it seems not improbable that, the "new learning" in architecture having come into general acceptance shortly after the house was finished, there may have been a feeling of disappointment on the part of the owner at being belated in architectural taste; a disappointment to be salved to some extent by the erection of a new classical framing to the entrance. And that would account for the apparent concentration of architectural richness in and about the entrance. Of course, in pure Elizabethan houses we do find, often, the entrance with a kind of quasi-classic treatment, but it is always with a very corrupt form of the order; but one can hardly look at this example of Cobham and regard it as a thing designed along with the rest of the building; it has all the appearance of an addition, perhaps when the building was barely completed, but not contemplated when it was first commenced.

The illustrations given in the plates commence with a few examples which are sufficiently within the Tudor period to retain a lingering quality of mediæval taste. The best of these is the simple stone design of the doorway at Paynis Almshouses, Oundle, showing a Tudor arch under a square recessed moulding, while the heavy coping moulding sweeps round into a three-quarter circle carrying an obelisk, balanced by a similar obelisk springing from the straight coping at each side; the circular moulding leaves a three-quarter panel suitable for an inscription or symbol which would explain and justify this part of the design, but which does not appear; it is only a blank panel. Still, this is a simple, unpretending, and well-balanced design for a gateway in a boundary-wall, and it is one on which a good many variations might be based. Beyond this, the examples consist for the most part of various forms of that long favourite type, the doorway flanked by a pilaster or a column at each side, with an entablature over; with some further plates illustrating the more modern device of the projecting hood carried on brackets or consoles, without the column or pilaster. The variations in detail which are possible on the simple scheme of entablature and flanking order are almost innumerable, though the general treatment is a repetition of the same effect; and perhaps no method of architecturally emphasising a doorway in a quiet and unostentatious manner has been invented which is more suitable and more generally pleasing. At the same time we certainly do not admire all the examples illustrated here. The doorways with an order, it may be observed, divide themselves into two classes, those with an arch over the doorway beneath the architrave, and those (for the most part later types) in which the doorway has a straight

lintel following the line of the entablature. Unless where the doorway is a very wide one, and seems constructively to require the arch, the type with the straight head is the more consistent and satisfactory in its lines. With the arch there is the difficulty of knowing what to do with the spandrel; and something has to be rather too obviously invented to fill or partly fill it. This is obvious enough in the doorway from Sackville College, East Grinstead (plate 8) where the two little circles in the middle of the spandrels have no meaning whatever and no decorative effect; they are merely put there because the designer thought he must put something into that otherwise blank triangular space. In the doorway of the south wing, Cobham Hall, and in the north doorway Hatfield House (plates 11 and 12) the spandrel is left plain, which is a more satisfactory treatment than an unmeaning attempt at ornament. The Cobham doorway looks anything but admirable, illustrated as it is in connexion with the heavy corbelled base of the oriel over with its large coarse egg-and-tongue ornament, all on a totally different scale from the details of the door entablature. This, as in the more pretentious Cobham entrance before referred to (shown in plate 9), is a case which suggests that the door framework and entablature was an afterthought and inserted, as a specimen of the new style, in a manner quite irrespective of the other portion of the building. It is impossible to suppose that any architect or owner (if the owner were his own architect) could have simultaneously drawn and caused to be executed these two pieces of detail in close contiguity, and totally out of scale and character with each other (see fig. 1); and if it is assumed that he did so, this is a very bad example to offer without note or comment to students. The entrance from Hatfield, just referred to, and the other one from the same house on plate 13, are examples of that playful treatment of the finish above the entablature which is frequently seen in Elizabethan work, and which consists of a freely treated ornament in the same style as the "strap-ornament" characteristic of the style, but with a higher relief; this is a very suitable kind of finish, since it forms an admission that the whole business of column and entablature is only ornamental, and does not need the heavy practical finish of a pediment over it, to express a slope of roof that does not exist. The broken pediment, in its various forms, was an experiment with the same object, and excusable on that account; it is objected against it that it is unmeaning, and so on, but that is exactly its object—to show that the form is only used as a kind of finish and without any structural meaning. Another example of the playful decorative finish above the entablature is shown in the example from Aston Hall, plate 16. On the other hand, the difficulty of dealing with the spandrel in the case of a semicircular doorhead could not be more unhappily illustrated than in the other doorway from Aston Hall, shown on plate 17, with its clumsy projecting triangles in the spandrels. It is a poor piece of work altogether, and not worth illustration.

Among examples that are well worth attention, on the other hand, may be mentioned the architectural treatment of the doorway with a panel and window over it, from Wakehurst Place (plate 14), all comprised under the same grouping, and a very

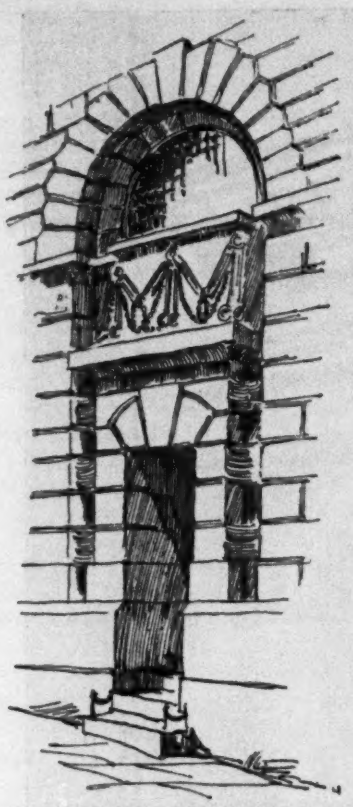


Fig. 2.—Doorway, Newgate Prison.

complete and refined piece of seventeenth-century work. Among the examples in which the doorway alone is separately treated, several from London have great merit; that from St. Helens (plate 23), with the returned mouldings of the architrave fitting on to the caps of the flanking pilasters; that from Great St. Helens (plate 35), a fine bold piece of work; and that from Crutched Friars (plate 39), in both of which there is the same picturesque little device of turning up the architrave mouldings in the centre so as to appear to support the central break of the cornice; and that (just destroyed) from Newgate, given as the first among Mr. Tanner's sketches to illustrate the literary portion of the book. This latter, of which we give a reproduction (fig. 2), is a remarkable piece of symbolic expression in masonry, produced by the simplest means.

The practical defect of the order and entablature treatment of the doorway was that it provided no shelter, or very little, for any one standing on the doorstep; and it was probably the perception of this which led to the adoption of the more modern form, illustrated by several excellent examples, of the projecting hood carried on decorative brackets or corbels, with no flanking columns. This form of doorhead lends itself well to treatment in woodwork, and perhaps the best example given is one of the fine carved doorheads from Queen Anne's Gate (plate 43). In another example from the same neighbourhood sketched by Mr. Tanner (19, Queen Anne's Gate—an address well known in the architectural profession), the projecting hood and carved pendants are combined with the flanking pilasters, also covered with carved ornament. Among the examples in the plates that from Uxbridge (plate 49), in which the hood takes the form of a pediment, is a very fine one, remarkable for the bold and rich treatment of the carved brackets. For the shell form of canopy, of which the authors give a good many examples, we have no great admiration; it usually looks heavy and clumsy, and out of scale with the other details, though no doubt it gives occasion for some clever feats of joiners' work.

We have to thank the authors for a very interesting collection of illustrations and a very well-written essay on the subject in hand; only we hope that young architects will make use of it for suggestion in design rather than for direct imitation of the examples given.

NOTES.

The Paris Metropolitan Railway.

IN pursuance of recommendations made by the commission of inquiry into the recent disaster on the Paris Metropolitan Railway the Prefect of Police has made known to the company the nature of the reforms and precautions to be adopted for the safety of passengers. These measures were classified in three series: (1) those which were to be executed at once; (2) others to be introduced before September 5; and (3) others to be commenced before November 1. The first series requires the appointment of an inspector for every five stations; every case of short-circuiting is to be reported to one of these inspectors, who is thereupon to determine the course of action. Independent oil lights are to be provided in every station to indicate the way out, and all the unnecessary barriers and automatic machines that now obstruct the passages and platforms are to be removed. These very sensible provisions have already been carried into effect. By the second series the company is instructed to isolate all motor-cars from other vehicles in the trains. All offices and installation boxes at the stations are to be of non-inflammable material; an independent system of lighting is to be installed; and fire-alarms are to be provided and placed in telephonic communication with the nearest fire-station. The third series of the regulations advises the company to study other systems of traction in which there are fewer dangers of fire or panic than in the system now used. It provides that the third rail, conveying current, is to be properly guarded, so that passengers who may be obliged to walk along the track may not be exposed to the danger of electrocution; that every station shall have at least two exits; and that air-shafts are to be constructed between the stations. The recommendations to which we refer were to some extent suggested in our recent article on the subject.

Exhibition of Building Improvements and Decorative Art, Brighton.

THE Aquarium Committee of the Brighton Town Council are arranging, in continuation of a scheme of periodical trade exhibitions, an exhibition of building improvements and decorative art in the Grand Aquarium, from September 23 to October 10 inclusive. It is the desire of the Committee, we are informed, to organise an exhibition of all those things which are novel and attractive in the building world, giving due prominence to artistic, decorative, and modern improvements rather than to ordinary and staple articles of utility long since recognised. At the same time exhibits of historical interest and those illustrative of the progress of British architecture will be welcomed. Decorative metal-work, art wall decorations and enrichments, the best appliances for lighting, sanitation, ventilation, and fireproof construction, mechanically ornamented woodwork, improvements in glazing and

roofing, artistic household fixtures and fittings, will receive special attention; and many other exhibits are invited. The Consultative Committee which has been formed includes many of the architects and builders in Brighton, and others from beyond the limits of the borough, and no doubt an interesting exhibition will be arranged. Three gold medals, three silver medals, and six bronze medals will be awarded to meritorious exhibits. A diploma of honourable mention will also be adjudicated to the best exhibit in each of the classes represented. A silver cup will be awarded to the exhibit considered the most attractive and best displayed. Intending exhibitors can obtain further information from Mr. Ed. S. Michel, Organising Manager, Grand Aquarium, Brighton. The Aquarium Committee, having decided to introduce a new heating system in the building, offer a special prize of twenty guineas for the best proposal, to be accompanied by plans and estimates, with or without illustrative working models, the cost not to exceed 600*l.*

Extensions at Euston.

Two years have now elapsed since the widening operations were commenced by the London and North-Western Railway Company near Euston Station, and good progress has been made with the scheme. Various difficulties have been encountered and successfully overcome. The site, upon which several hundreds of men are now engaged, was formerly covered with poor-class residential property, all of which has been acquired, and new homes have been found for the tenants. Three main thoroughfares — Mornington-street, Stanhope-street, and the Serpentine-road—have practically disappeared. The principal object of the new works is to afford better accommodation for shunting and housing passenger carriages close to the terminus. At the present time, vehicles arriving at Euston have to be taken to the sidings at Willesden—a distance of five miles, and brought back again when required at the terminus. This involves about ten miles of unremunerative traffic, besides occupying the lines to the hindrance of other trains. A large space has been cleared near Mornington-crescent, and the sheds to be erected here will give room for about 350 vehicles, in addition to siding accommodation for others. These sheds will be in communication with the station by means of a subway, so that trains may be run out of Euston and through the subway without obstructing passenger traffic. In addition, a tunnel is being constructed for the use of engines proceeding to the works at Chalk Farm. The operations cover a total area of about 5,000 square yards, and the quantity of excavation involved is estimated at 450,000 cubic yards. It is hoped that the whole of the works will be completed by the end of 1904, and there is no doubt that they will prove to be of very material assistance in dealing with traffic.

Testing Road Materials.

In the choice of materials for the construction of macadam roads there is sometimes difficulty in determining the most suitable kind of rock for particular highways. Many engineers are able to bring to bear upon this subject the weight of valuable practical experience, while, on the other hand, there are some who would be glad to confirm their conclusions by the aid of experimental data. Tests of materials of construction in general have proved to be most invaluable, and it is quite reasonable to expect that road materials should form the subject of similar inquiry. In the United States, laboratories have been equipped for testing such materials at Harvard, Columbia, Cornell, and California Universities, and also in connexion with the Board of Agriculture. The last mentioned of these establishments is very completely furnished with suitable appliances for tests relative to abrasion, impact, toughness, absorption, hardness, and compressive and tensile strength. Paving bricks also are tested according to the standard adopted by the National Brick Manufacturers' Association, while for the classification and naming of materials special modifications of petrographic and chemical analysis are employed. The interpretation and application of results receive the most careful attention, and the work of this, and the other laboratories mentioned, is one of great value. Of course, the characteristics of road materials must be considered with regard to their suitability for the realisation of a strong, tough, and well-drained road foundation, as well as of a hard and well-knit surface. Laboratory results may not supersede practical knowledge, but they cannot fail to be of material assistance in pointing to the materials that ought to yield the most satisfactory results under the conditions obtaining in any particular case.

The Royal Horticultural Society, and their Gardens.

SIR THOMAS HANBURY has recently purchased the estate and garden of the late Mr. G. F. Wilson, F.R.S., at Wisley, near Woking, with a view to presenting the property to the Royal Horticultural Society. The estate extends over sixty acres, whereof a portion is at present under tillage, and the remainder has been devoted to the cultivation of plants in various chosen soils. Sir Thomas Hanbury's gift thus provides the Society with a new garden in substitution of their grounds at Chiswick, which have become so closed in with adjacent buildings during the last forty or fifty years that they are rendered quite unsuitable for their purpose. In the course of next year the Royal Horticultural Society will celebrate the hundredth anniversary of their formation. In 1821 they migrated from Kensington (where is now the Addison-road railway station) and Ealing to their gardens at Chiswick, where they had taken a lease, at a rent of 300*l.* per annum, of which seventeen years are still unexpired, of a portion, about thirty-three acres, of what had been market-gardeners' grounds belonging to the Duke of Devonshire's seat, Chiswick House. The buildings there were erected, 1822-3, after designs and plans by William Atkinson and W. H. Ashpitel. The grounds at Chiswick, formerly the scene of highly fashionable fêtes and exhibitions, and where Sir Joseph Paxton worked as a ground gardener at a wage of 12*s.* per week, have since been reduced to eleven acres. In 1859 Sir Henry Cole, R. Redgrave, and Captain Fowke, R.E., laid out twenty acres at Kensington, rented from the Commissioners for the Exhibition of 1851 by the Society, for whom Sydney Smirke designed the two side arcades in curves to meet the large conservatory at the north end—illustrated in our columns of July 9, 1859, and December 29, 1860. The planting, &c., of the gardens was carried out by Mr. Nesfield. The gardens were gradually altered and curtailed by the erection of pavilions and galleries for a series of annual exhibitions held in 1871-4, and were further dismantled for the series of 1883-6, begun with the Fisheries Exhibition of 1883. All the materials having been sold in 1887-9 the site was taken for Imperial Institute-road, and the blocks of flats and the public institutions since built between the Royal Albert Hall and the Natural History Museum. The Society's new London hall and offices are now being erected on the site of four houses, Nos. 77-80, Vincent-square, Westminster, Mr. E. J. Stubbs being the architect.

Royal Caledonian Asylum, Holloway.

THE demolition has been begun of the buildings in Caledonian-road, which were purchased, together with the site of 2 acres, for 16,500*l.* by the London County Council for the erection of dwellings to accommodate 1,400 persons of the industrial classes. The institution, originated in 1808, was firmly established in 1813 on behalf of the children of Scottish soldiers who have fallen on the field of battle; it was incorporated two years afterwards by Act of Parliament. The asylum was originally opened for about fifteen children in Cross-street, Hatton-garden, and was then removed to Copenhagen-fields, in Islington, whence it migrated to the premises in the Caledonian-road, which have a frontage of 248 ft. to the main thoroughfare. The Governors of the charity secured a site of 7 acres at Bushey, in Hertfordshire, where the new asylum buildings have been erected after Sir William Emerson's plans and designs.

Glasgow School of Art.

THE Glasgow School of Art, which is the central institution for higher art education in Glasgow and the West of Scotland, has issued its prospectus for session 1903-4. This excellent school supplies a training in drawing and painting, architecture, sculpture, and the applied arts. In connexion with the latter branch, technical art studios have been built, and artist-craftsmen give instruction in stained glass, interior decoration, needlework, book-binding, ceramic decoration, enamels, gold and silver smiths' work, block-cutting, mosaics, sgraffito, gesso, lithographic design, posters, &c., metal work, wood-carving, stone-cutting, and furniture. Besides, a loom has been erected for the use of textile designers, and a practical weaver gives demonstrations. The drawing and painting upper school includes a course from the life, composition courses, a course from the antique, anatomy lectures, and animal classes. In the architectural section the instruction given meets the requirements of the examinations for the membership of the Royal Institute of British Architects, but in addition to the subjects included in that scheme the school course provides also for the study of nature from life. A four years' course is given, but students not wishing to take the full curriculum may join any one of the classes or lecturer. Through the co-operation of architects in the City it is intended to institute a series of day classes—a scheme which deserves the full support of

all interested in architectural education. The modelling course is arranged in four groups, commencing with elementary drawing from the round and modelling and ending with modelling the figure from life and its adaptation to architecture, &c. In the design and decorative art classes for this session, furniture, carpets, wall-papers, and embroidery will be dealt with. Diplomas and certificates of the Scotch Education Department are issued in the classes for drawing and painting, architecture, sculpture, and the applied arts. The total number of students for last session was over 1,300, and the influence of training so efficient as that given in this school must continue as a healthy stimulus to the art of the country.

The Architectural Association Curricula.

WE have received particulars of the curricula of the Architectural Association for the session 1903-1904, which show that this energetic society is consistently carrying on the work of providing educational facilities, both in day and evening classes, for young men about to enter the profession or already engaged in architects' offices. Mr. H. P. G. Maule, who is the new master of the Day School, is likely to prove a worthy successor to Mr. Bolton, and he will have as his assistant master Mr. W. Aston Jones, with Mr. J. H. Squire as demonstrator. It is a pleasure to read that the result of the two years of the working of the Day School has fully come up to the anticipations of the Committee, both in the number of students and in the practical results of the work of the School; and judging from the particulars before us, there are good reasons for thinking that this success will be repeated in the ensuing session. The lecturers and instructors in the Evening School will be practically the same as those of last year, the only alteration being that the lectures on Greek and Roman architecture by Mr. F. T. Baggallay will be given by Mr. Hugh Stannus, who will also lecture on Classic ornament, in place of Mr. Banister F. Fletcher. The Association, which has been so long hampered in its work owing to inadequate accommodation, will, we are glad to say, remove in March to the premises formerly occupied by the Royal Architectural Museum and Westminster School of Art, Tufton-street, Westminster. The Museum will be open free to the public as before, but students and members will have exceptional facilities for drawing from the casts contained in the Museum.

The Architectural Association Lectures.

THE curricula include the fortnightly Friday lectures of the Association, which have been such an excellent feature of the work of the society for many years. The annual general meeting will be held on October 2, when the President, Mr. H. T. Hare, will deliver his address and distribute the prizes; and on the 28th a conversazione will be held at the Royal Institute of Painters in Water Colours. The meeting on October 16 should be of special interest to members of the Association and all those concerned in architectural education, for on that date the past and present masters, Messrs. Arthur Bolton and H. P. G. Maule, will read a paper or papers on "The Day School in Relation to Architectural Pupilage." The following are the lecturers, subjects, and dates of the succeeding lectures:—November 6, Mr. C. A. Nicholson on "Modern Churches"; November 20, Mr. H. M. Cautley on "Farm Buildings"; December 4, Paper by the Camera and Cycling Club on "Photography for Architects"; December 18, Mr. G. P. Bankart on "Old Stucco and Plaster Work with Reference to Modern Possibilities"; January 8, Mr. Hugh Stannus on "Egyptian Architecture"; January 22, Mr. Maurice B. Adams on "As to the Making of Architects, with Examples of Draughtsmanship"; February 5, Mr. W. A. Harvey on "Cottage Homes"; February 19, Mr. W. Henry White on "Corner Houses"; March 4, Mr. John W. Simpson on "Schools"; April 22, Mr. W. Gilbert on "Craftsmanship"; May 6, Mr. A. E. Munby on "The Value of Science in an Architectural Curriculum."

A Novel Offer to Architects.

THE Guardians of Windsor Union are "prepared to receive offers stating upon what commission per cent. architects are willing to prepare plans, and for preparing plans and superintendence of certain work proposed to be carried out by the Guardians at the Union Workhouse." The offers are to be delivered to the Clerk on or before Saturday, September 12 next, and the Guardians do not bind themselves to accept the lowest or any offer. The offer is surely unique in the practice of architecture. "The Guardians do not bind themselves to accept the lowest or any offer." How very careful! Perhaps, after all, the 10 per cent. man may be chosen, and, in any case, the "winner" is safeguarded against the losers. If there is no winner, the applicants have poor consolation from the knowledge that they have priced themselves in vain.

LETTER FROM PARIS.

THE jury appointed to examine the twelve sets of plans and designs submitted for a monumental circus at Limoges, has awarded the first premium and the execution of the work to M. Emile Robert, architect, of Clamart. The second premium, of a value of 120*l*., was awarded to M. Deperthes.

M. Charles Girault has terminated the architectural portion of the monument by Falguière to be erected to the memory of Pasteur on the Place de Breteuil, in the place of the iron column of the artesian "puits de Grenelle" which now occupies this square, but is very shortly to be removed.

A competition has been opened for the construction of a new infirmary annexe to the National Asylum of St. Maurice near Paris.

M. Gustave Rives, the well known Parisian architect, has been promoted to the dignity of Officier of the Legion of Honour.

The City of Paris is somewhat in difficulty concerning the award of the Prix Lheureux this year. This prize was founded three years ago, by the widow of the late M. Lheureux, to be awarded, in alternate years, to a sculptor or an architect author of the finest monument or edifice of importance erected during the two years preceding the award of the prize. The prize was awarded to M. Dalou in 1900, for his monument of "The Triumph of the Republic," and in 1901 to M. Charles Girault, for the Petit Palais on the Champs Elysées. Last year the prize went to M. Barrias, for his monument to Victor Hugo; but this year there seems to be no architectural work of sufficient importance to meet the terms of the Lheureux prize. The only two buildings which could be taken into account, the annexe of the Bibliothèque Nationale by M. Pascal, and the new buildings of the Bourse at Paris by M. Cavel, are still under construction, and can hardly compete for the prize until 1905. It has been suggested that the monument to the late Charles Garnier, by M. Pascal, which was inaugurated in June last, although not strictly an edifice in the terms of the Prix, is still of sufficient architectural character and importance to allow the Prix Lheureux to be awarded to its architect.

The Union Céramique de France has organised a competition amongst French architects with the intention of popularising the employment of ceramic materials of all kinds, either as materials for construction, or as products for interior and exterior decorative uses. The subject for competition is a large hotel for a provincial town or a watering place. The jury will consist of eight well-known architects—MM. Moyaux, Louvet, Bouhon, Boileau, Deslignières, Wallon, Yvon, and Alinot—various managers of the Union Céramique and of large hotels, and three members to be appointed by the competitors. Four prizes will be awarded, the first prize having a value of 60*l*. and carrying with it the title of "Architect to the Union Céramique." Several medals are offered by the Touring Club of France.

The preparatory work for the new bridge for the metropolitan railway, which is to cross the Seine at Passy, will necessitate the removal in a few days of the existing iron foot-bridge which crosses the Seine at the spot where the new bridge is to be placed. This foot-bridge, which weighs about 200 tons, will be moved a short distance down the river, and this removal will be accomplished by an ingenious and apparently simple method. It is proposed to place two large river barges under the bridge and load them with sand until the usual water line is submerged by about 1 mètre: the space between the barges and the underside of the bridge will then be filled up with timber supports and the boats emptied of the sand they contain, when it has been calculated that their buoyancy will be sufficient to raise the bridge the height necessary to enable it to be floated by the barges some little distance down stream to its new situation.

The exterior of the Madeleine will be for some time partially hidden by the immense scaffolding necessary for the restoring work now going on under the direction of M. Raphael Loiseau, official architect of the Eighth Arrondissement, in which this church is situated. The restoration of the remarkable sculptured pediment on the main front of the building is not included in the scheme of work; and the Union of Valenciennes, the town which gave birth to Henri Lemaire, the author of this work, has appealed to the Minister of Fine Arts to take in hand its restoration, and to place in a suitable position a tablet bearing the name of the sculptor.

Now that the new buildings at the Bourse are to some extend relieved of their scaffolding, the two new wings with their lateral prolongation of the colonnade form, with the original building, a more harmonious whole than had been anticipated, and the result is highly creditable to M. Cavel, who has carried out a very difficult task with much judgment and ability. This will no doubt be still more evident when the new building has been toned down by time and weathering.

The admirers of the works of Chasseriau have at last the opportunity of seeing in the Louvre one of the best productions of this painter. This is one of the mural paintings of the old Cour des Comptes, which fortunately escaped the fire, and having been sawn off the wall, was successfully mounted on canvas and offered to the Conseil des Musées. It is an allegorical subject representing "Peace."

M. Redon, architect to the Louvre and the Tuileries, has commenced the construction of a grand staircase to give access to the new galleries containing the Thomy-Thierry collection. The staircase leads up from the Persian Pottery Gallery. He is also commencing the restoration of the splendid group by Carpeaux which decorates the attic of the Pavillon de Flore, and has suffered very severely from the effects of weather.

The Government has re-appointed M. Paul Dubois as Director of the Ecole des Beaux-Arts for a new period of five years. The appointment is generally approved, every one recognising the tact, amiability, and firmness which the eminent sculptor has already shown in this important office. M. Perrault-Dabot, the archivist to the Commission des Monuments Historiques, has been appointed to the duties of additional Inspector-General in respect of "objets mobiliers."

The Académie des Beaux-Arts has accepted, subject to the approval of the Conseil d'Etat, the legacy of all his property left by M. Leon Jean Roux, the late architect. This legacy, which amounts to about a million francs, will

serve for the foundation of various prizes to be awarded, after competition, to painters, sculptors, architects, and engravers.

The sudden and unexpected death of M. H. Bunel, architect-in-chief to the Prefecture of Police of Paris, is a great loss to the City, of which he was one of the most eminent officials. M. Bunel, who was sixty-three years of age, was a former pupil of the Ecole Centrale, and in 1866 entered the service of the Prefecture of Police as a supernumerary architect. It was not long, however, before his abilities became recognised; and as member of the "Conseil d'Hygiène et de la Salubrité," of the "Vieux Paris" Committee, and of the "Conseil Supérieur des Théâtres," he acquired a wide reputation. For seventeen years back his assistance and advice had been sought under all grave circumstances which affected the City — whether arising from the attempts of anarchists, or from accidental catastrophes such as the fires at the Opéra Comique and at the Charity Bazaar, and recently in regard to the dreadful accident on the Metropolitan Railway. During the exhibition of 1900 his experience was of great value in providing for the public safety. He was a man of remarkable practical insight, whom it will be very difficult to replace.

The department which M. Bunel directed at the Prefecture of Police is principally concerned with the maintenance of public convenience and safety in the streets. The staff includes ten architects of arrondissements, five supernumerary architects, as well as the sanitary inspectors of lodging-houses. These architects have under their surveillance the fencing of waste ground; the barring of streets for repair; the depôts of materials; scaffoldings; trenches for the conveyance of water, gas, and electricity; the prevention of obstruction in the streets; the preservation of order in connexion with public entertainments, such as theatres, concerts, and balls; and, lastly, the inspection of buildings in respect of their security from fire. As architect-in-chief, M. Bunel had also the duty of visiting prisons, and of inspecting public buildings, and of inquiring into each case in which a new license for public performances was applied for. It will thus be seen what important and delicate functions the recent eminent official was answerable for.

The death is also announced of another eminent official, M. Larroumet, whose name was more familiarly known to the world at large, since, besides having been for some time Director of the Department des Beaux-Arts, he was also a distinguished art-critic. M. Larroumet was born in 1852, and in 1884 was nominated a Professor at the Sorbonne. In 1887 he became Chief in the Department of Public Instruction, and was elected in the following year Directeur des Beaux-Arts in the place of M. Castagnary. In 1891 he was elected a member of the Académie, of which he was afterwards appointed perpetual Secretary. Among his numerous writings may be specially mentioned that entitled "Art in its Relation to the State," and an interesting critical study on the works of Meissonier.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS. — Ten of the members of this Society visited Ashbourne, Derbyshire, on Saturday, August 15. Almost continuous rain prevented much outdoor sketching. Fortunately, the interior is very interesting, including some good Early English windows and Decorated work and some fine tombs. The curiously irregular transeptal plan, with chapels, gives some very picturesque vistas internally, and a long day's sketching proved all too short. On the evening of August 25 fifteen members visited Parr's Bank, Spring-gardens, by the kindness of Messrs. C. Heathcote & Sons, the architects. Mr. Heathcote, jun., explained the building to the visitors, and the visit was a very interesting one.

A BRICKWORKS MONOPOLY. — In his annual report on the trade and commerce of French Guinea, Captain Cromer, the British Consul, mentions that about five miles from Conakry, close to the seashore, there is an excellent deposit of brick-making clay, and an enterprising gentleman has started the manufacture of bricks and tiles of various kinds. As he has now practically overcome the initial difficulties inseparable from the starting of a new industry in West Africa, and as, in addition, he has a monopoly of the manufacture of bricks in the colony, this undertaking bids fair to be successful.

CEMENT JOINTS IN DRAINS AND DRAIN-TESTING.*

IT has been patent to me for many years that cement joints in stoneware drain-pipes fail to maintain their power of standing both, or either, the smoke and hydraulic tests, and this, sometimes, soon after the laying of the drains, and sometimes after a considerable lapse of time. As a rule, however, I find the failures can be traced to either the materials being at fault or the method of laying. These failures, notwithstanding the fact that the drains have been tested by water and found watertight at time of construction, are due to one or other of the following causes, viz.:—1. Swelling of the cement in the joint. 2. Uneven expansion of the concrete bed, especially if made of "hot" cement or ground or lias lime, and not of equal thickness, as when deep holes are filled up in the bottom of trench or in large "hand-holes," the expansion lifts the pipes off their bed. 3. Uneven settlement of the bed, causing deflection of the adjoining joints. 4. Uneven or careless filling-in of the trench, or workmen walking on or knocking the pipes, or by débris falling, &c. 5. Testing or filling in the trenches before the cement is thoroughly hard. 6. Contraction of the cement in the joints. 7. Failure of the joint to stand the pressure, excepting, of course, the jointing material.

Causes 1, 2, and 6 are due entirely to the quality of the materials at the time of using or to their wrong manipulation. A thoroughly practical and theoretical knowledge of Portland cement is absolutely necessary that no failure may arise from this material. In this short note a complete specification of this material cannot be given, but suffice it to say it should be tested for contraction, expansion, adhesion, disintegration (by boiling for twenty-four hours after parts have been made for twenty-four hours), specific gravity, which should be about 3·1—weight per bushel is an unreliable guide—also whether it contains free lime or free gypsum; then further for tensile strain, which should be not less than 500 lbs. per square inch—at seven days the briquettes, being mixed up as stiff as possible, are "thumbed" into the moulds—and lastly, but perhaps the most important, its fineness,—80 per cent. of it shall pass through a sieve having 32,400 holes per square inch, and the whole through a sieve of 2,500 holes per square inch. If not very finely ground it may expand months after using, thereby cracking the flanges or loosening the key between the pipe and the cement.

Cause 2. I do not agree with the use of hot lime for foundations, owing to its expansion; so far as lime is concerned, it should rank in the same category as clay joints. Cement only should be used.

Cause 4. As to this, probably more failures in drains found by retesting arise from these faults than any other, and carefulness alone is the remedy; and the same applies to Cause 5, both respecting filling and testing.

Cause 7 applies in many cases — (*a*) From improper form of joint. (*b*) From the sockets and spigots of the pipes being so highly glazed as not to form a proper surface to allow the cement and pipe to thoroughly adhere to make a permanent water-tight joint.

The only cement joint I know that will stand satisfactorily the water test is this, *i.e.*, the cement should be keyed at both ends, the whole space in the joint being filled in with cement without gaskin or other material, and my personal experience also proves that no sand should be used. The most important point at which the joint should be perfect is between the end of the spigot and the bottom of the socket, a fact which is overlooked by many engineers who use or specify gaskin, &c. When the pipes are being glazed in the kilns they are stacked on end, one on top of another, and where the socket and spigot touch the surfaces are unglazed, forming a natural key for the cement. If from careless stacking the ends are glazed, they should be chipped. Joints made with gaskin should be strongly opposed:—(1) Because they allow of a large amount of play in the line of pipes, allowing the pipes to "sag," thus breaking the seal between the glaze and the joint; (2) because they allow of inferior workmen making the joints; (3) because they will not stand any pressure, especially if subject to vibration. Joints made with cement should be absolutely free and rigid, and drains with cement joints should be laid on a foundation which has no possibility of yielding or uneven settlement if it is intended they should remain watertight. If concrete be used, it should be very fine, no part to exceed a ¾-in. ring gauged about 6 to 1 of Portland cement (or stronger, according to soil), and should contain sufficient sand to cause it to consolidate in a solid mass around the pipes—in fact, to form a concrete pipe outside the stoneware pipe.

When the cement used has been of the proper quality, I have no hesitation in saying that very many of the "failures" found upon retesting arise from the breaking of the seal or cohesion between this glazed surface and the cement, and this may arise from many causes tending to alter the position of the pipes after first making the joint, either before the cement is permanently hard or at any future time, or from the contraction of the cement. It is most imperative that no cement be used for drains which show any signs of contraction, and that as little water as possible be used in its manipulation. These facts are proved by careful observation, which shows that the water oozes out between the cement and the pipe.

Some authorities assert that expansion and contraction in the length of drain causes failure, but I have no personal knowledge of such a result, and cannot in any way conceive how the temperature in a sewer can so affect stoneware and cement. Perhaps this idea has been conceived along with the invention of elastic joints, such as mastic, but I cannot accept the theory without proof, which at present I cannot find.

Cement-jointed drains are now too well established to be altered from general use; it would almost, if not absolutely, require an Act of Parliament. Granted this hypothesis, we have to try and make them perfect without resort to patent joints or patent pipes. How can this be done? 1. By having a perfectly rigid foundation or bed. The only way to obtain this is by levelling up on rock with suitable cement concrete, or in other soils by a sufficiently thick bed of Portland cement concrete, which should be thoroughly hard and set before laying the pipes. 2. By carefully testing the cement to find its qualities, and selecting suitable material. 3. By instructing workmen, and employing only those who can be relied upon to properly manipulate the materials, and who thoroughly understand the causes which produce failure, not only at first testing, but at future tests in years to come. 4. By pipe manufacturers sending out pipes whose spigots and sockets are not glazed, the glazing of which can be very materially altered by proper stacking in the "salt kiln." 5. By engineers, architects, and local authorities clearly specifying, in detail, not only what has to be done, but by pointing out what has to be avoided.

* Part of a Paper by Mr. James G. D. Armstrong, Professional Associate, Surveyors' Institution, read before the Conference of Engineers and Surveyors in connexion with the Congress at Bradford of the Sanitary Institute.

COMPETITIONS.

MECHANICS' INSTITUTE, PONTARDULAIS.—It has been decided to erect a Mechanics' Institute in Pontardulais, to cost about 3,000*l*. An open competition was recently held, and the designs selected were by Mr. W. Beddoe Rees, A.R.I.B.A., 37, St. Mary-street, Cardiff, who was awarded the premium of 10*l*. 10s.

HAYMARKET THEATRE. — The London County Council have proposed to Mr. Frederick Harrison, the lessee, that he should carry out certain structural alterations of the playhouse in order to bring the building up to the standard of modern requirements. The theatre was erected, after plans and designs by John Nash in 1820-1, for Morris and Winston at a cost of 18,000*l*. upon a site measuring 61 ft. by 135 ft., leased for ninety-nine years from the Crown, and situated a few feet to the south of John Potter's "New French Theatre"—since known as the "Little Theatre," and more popularly as "Foote's Theatre"—which had been opened on December 29, 1720. Nash's building was distinguished for its oblong and spacious pit, which was considerably reduced for an enlargement of the stalls when the auditorium was remodelled by C. J. Phipps for Sir Squire and Lady Bancroft who removed thither from the Prince of Wales's Theatre in Tottenham-street about thirty years ago. During recent years extensive alterations have been made at the back of the house: a new room for the manager has been built by Messrs. Lee & Pain, and a fire-resisting screen has been fitted in the proscenium. The clock which Samuel Foote presented to the green-room of the old theatre has been preserved, and is still, we believe, in the possession of Sir Squire Bancroft.

EXPERIMENTS IN SEWAGE TREATMENT AT SHEFFIELD.*

AT first experiments were on a small scale, some of the existing tanks being utilised. Effluent from the lime process was treated by double contact, the medium being small coal, and raw sewage was also dealt with, both coal and gas coke being used in the filters. Satisfactory results were obtained during the two years over which these first experiments extended, but the beds lost considerably in capacity, owing, no doubt, to the large amount of detritus which passed to them and accumulated. The results were, however, considered sufficiently good to warrant more extensive experiments, and early in 1899 six large contact beds, covering a total area of 9,500 square yards, were constructed. The ground, which is of a clayey nature, was excavated to a certain extent, and the material so obtained was used for the banks and divisions between some of the tanks. Three of the new beds were filled with large gas coke to a depth of 5 ft., and three with coke breeze to a depth of 3½ ft., the former acting as first contact beds and the latter as second contact beds. Raw sewage which, like the rest of the sewage entering the works, had passed through catch-pits was then pumped into the beds without further settlement. The resulting purification, which has since been carefully observed and recorded by a series of analyses extending up to the present time, is regarded as exceedingly satisfactory. The final effluents have at all times been non-putrefactive, capable of supporting fish life, rich in nitrates, and conforming to the standards employed by the Rivers Board Authorities.

The one serious defect so far discovered is the reduction in capacity, attributed to the silting up of detritus and other solids not intercepted by the catchpits. Specimens of the deposit so formed have been analysed and the result is as follows :—

Organic and volatile matter 44·3 per cent.
Mineral matter ... ... 55·6 "

On account of this decrease in capacity it was decided to elaborate the experiments by treating sewage from which, by preliminary treatment, the detritus and suspended matter had as far as possible been removed, and accordingly an open septic tank and further double contact beds were installed. By this method raw sewage, after passing a ½-in. screen, is passed to a detritus tank, 39 ft. by 4 ft. 6 in. by 3 ft. deep, and thence into a precipitation-tank of 50 000 gallons capacity, which is trapped at each end, and acts as an open septic tank. Sewage has been passed continuously through the tank at a rate of 57,000 gallons per twenty-four hours, and a portion of the effluent treated on two pairs of double contact beds, one pair being made of clinker and the other pair of burnt ballast. This process was commenced on June 22, 1900, and worked without the removal of any sludge until November 1, 1901. The water space having then become much reduced, the accumulation of sludge was removed, dried, and weighed. Estimations of the suspended solids entering and leaving the tank had also been made regularly, and from the data so supplied it is calculated that of the solid matter entering the tanks 32·9 per cent. was destroyed. The tank effluent is usually black in appearance (this being partially attributed to the presence of iron sulphide), and it frequently has an offensive odour. It also contains a considerable quantity of fine suspended matter, averaging 12·45 grains per gallon. Hydrogen sulphide is usually present in the vicinity of the effluent channel, and readily blackens lead plates or lead acetate paper. The sludge left in the tank is of varying consistency, some having to be removed with shovels. It has an offensive odour, but otherwise is not more difficult to deal with than sludge from the chemical precipitation process.

The purification effected by double contact on effluent from this open septic tank has been good. The final effluents have usually conformed to the commonly accepted standards of purity, but have not attained the high standard of the effluents from the fine coke breeze beds.

From time to time the capacity of the contact beds receiving the effluent from the open septic tank has been carefully gauged, and the following are some particulars of these gaugings :—

Details of First Contact Bed (Clinker).

Capacity of empty tank... 8,021 gallons.
Depth of material ... 3 ft.
Grade of material ... 2 in. to ¾ in.
Number of fillings ... 3 per day on 6 days per week.

Water Capacity of the Bed.		Percentage Loss of Capacity.	Number of Fillings.
Date.	Gallons.		
June 25, 1900	3,772	—	5
June 24, 1901	2,382	36·8	884
September 24, 1901	2,071	45·1	1,118
June 24, 1902	2,005	46·8	1,727
December 23, 1902	1,980	47·5	2,168
May 26, 1903	1,721	54·1	2,530

Details of Second Contact Bed (Clinker).

Capacity of empty tank ..... 8,900 gallons.
Depth of material ..... 3 ft.
Grades of material ..... ¾ in. to ¼ in.
Number of fillings ..... 3 per day on 6 days per week.

Water Capacity of the Bed.		Percentage Loss of Capacity.	Number of Fillings.
Date.	Gallons.		
August 13, 1900 ...	4,378	—	5
June 24, 1901	3,687	15·7	838
September 24, 1901	3,557	18·7	1,072
December 24, 1901	3,233	26·1	1,229
June 24, 1902	3,527	19·4	1,657
December 23, 1902	3,317	24·2	2,098
May 26, 1903.....	3,259	25·5	2,400

The material in the bed was turned over on March 12, 1902, when the capacity was increased in consequence. Finely divided solid matter is found to be deposited on the material of the first contact beds, and a slow decrease in capacity is taking place—a result which can only be expected in cases where the liquids dealt with contain suspended solids, some portions of which are composed of mineral matter. The second contact beds, on being dug over, considerably improve in capacity, and it therefore appears that much of the diminution observed after the initial loss is due to settlement of the material forming the bed.

Having in view (1) the good results obtained by the treatment on coke beds of crude sewage, which has not passed into a septic condition, (2) the large area of tanks required for the open septic process, (3) the comparatively large quantity of suspended solids in the open septic tank effluent, and (4) the danger of nuisance from these tanks, which at times is very apparent, it was decided to further experiment with sewage which had been allowed quiescent settlement in a tank, drawing off the supernatant liquid by means of a floating outlet, and dealing with the sludge separately, as in the case of a precipitation process. A precipitation tank similar in every respect to the open septic tank was, accordingly, set apart for this purpose, and supplied with sewage from the same delivery-pipe and catchpit.

A first contact bed of clinker was constructed to receive the effluent from this tank, and in addition a small experimental filter has been used for second contact in order to observe purification results. A portion of the material forming the first contact bed is graded, the smaller material being at the surface in order, if possible, to retain the suspended solids, and prevent the silting up of the bed generally.

Details of the method of working and capacity of the bed are as follows :—

Details of Contact Bed (Clinker).

Area of bed..... 221·3 square yards.
Average depth of material ..... 33 in.
Grade of clinker..... 1½ in. to ¼ in., with a 9 in. layer of 3 in. to ¼ in. and 3 in. of ½ in. to ¼ in. extending over half the area of the bed.
Number of fillings... Three per day on six days per week.

Water Capacity of the Bed.		Percentage Loss of Capacity.	Number of Fillings.
Date.	Gallons.		
August 9, 1901	16,070	—	5
August 8, 1902	9,830	38·8	842
December 28, 1902	9,924	38·2	1,157
May 15, 1903	9,167	42·9	1,517

The sewage, after settlement for two or three hours in the precipitation tank, has been allowed to flow upon the first contact bed, which is worked in a similar manner to the beds treating open septic tank effluent, and the sludge has been removed after every twelve fillings. The tank effluent has contained an average of 7·53 grains of suspended matter per gallon. The purification obtained has been very satisfactory, the effluent from the first contact bed having frequently conformed to the commonly accepted standard for oxygen absorption and albuminoid ammonia, and it has usually contained nitrates. The second contact effluent has been uniformly excellent, containing nitrates in considerable amounts, and remaining perfectly sound on incubation.

The following are typical analyses from a long series made during the experiments, both with the open septic tanks and what may be termed the sedimentation tanks :—

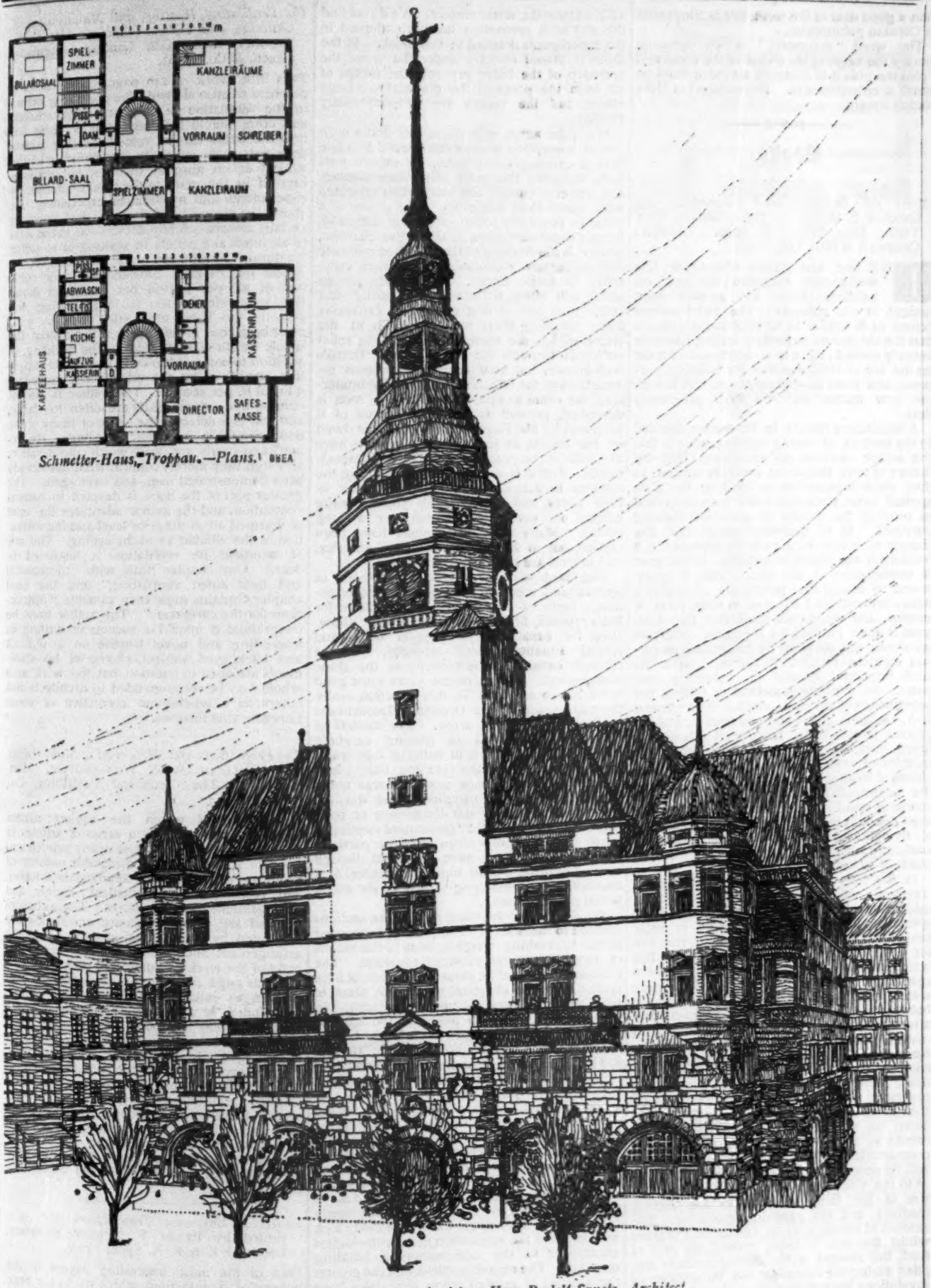
Results Expressed in Grains per Gallon.

Oxygen Absorbed in Four Hours.				Albuminoid Ammonia.				Nitrogen as Nitrates.	
Sewage.	Septic Tank Effluent.	1st Contact Effluent.	2nd Contact Effluent.	Sewage.	Septic Tank Effluent.	1st Contact Effluent.	2nd Contact Effluent.	1st Contact Effluent.	2nd Contact Effluent.
5·50	4·11	1·88	·71	·94	·62	·28	·09	—	·21
4·36	2·99	1·18	·51	·78	·49	·20	·08	—	·34
3·95	3·43	1·20	·75	·60	·40	·16	·08	—	·49
Sewage.	Settled Sewage.	1st Contact Effluent	2nd Contact Effluent.	Sewage.	Settled Sewage.	1st Contact Effluent.	2nd Contact Effluent.	1st Contact Effluent.	2nd Contact Effluent.
5·55	3·43	1·26	·53	·66	·36	·12	·05	·12	1·10
4·64	2·60	1·03	·41	·56	·32	·12	·06	—	·89
4·11	3·10	1·30	·44	·64	·45	·13	·05	·28	1·20

Up to the present the results obtained from the experiments described indicate that the sewage of Sheffield can be purified satisfactorily by the simple settlement of the sewage in tanks, and by subsequent treatment in double contact beds. In the case of settled sewage greater purification has been obtained than by the open septic tank process, although both systems have given effluents which are non-putrescible, and conform to any reasonable standard of purity for sewage effluents. The great advantage which it was anticipated would result from the action of the open septic tank in facilitating further purification has not been realised, nor, apparently, does the system present a solution of the sludge difficulty. As the proportion of sludge

* Part of a Paper by Mr. Charles F. Wike, M.Inst.C.E., City Surveyor, Sheffield, read at the recent Sanitary Institute Congress at Bradford.

Schmetter-Haus, Troppau.—Plans.



Schmetter-Haus, Troppau, Austria. Herr Rudolf Srnetz, Architect.

(Reproduced from the *Architektonische Rundschau.*)

destroyed is only about 30 per cent. and probably less, it is a question for serious consideration whether the large tank area required, the liability to nuisance, and the difficulty in dealing with sludge in bulk, are compensated for by the destruction of so small an amount of sludge. It is possible that, in dealing with some classes of sewage, superior purification is obtained after such a treatment; but this has not been the experience of the writer in treating over a million gallons per day of raw sewage on contact beds during the past four years. Probably the question is one which each authority must settle for itself, bearing in mind its own particular conditions and the varying trade wastes, &c., which occur and complicate the problem.

Albuminoid matter is certainly broken down by the action of the open septic tank, but the rate of the process is not known, and in the case of Sheffield it is not considered that the necessity of reducing sewage to the offensively putrefactive stage in order to effect efficient oxidation has yet been demonstrated.

SCHMETTER-HAUS, TROPPAU.

THIS illustration of a rather picturesque building is reproduced on a somewhat reduced scale from a recent issue of the *Architektonische Rundschau*. It is an example of modern German town architecture which is more to our taste, because restrained and well-balanced

than a good deal of the work that is illustrated in German publications.

The word "Schmetter" is we presume, merely the name of the owner of the company. From the plan it is evidently a kind of hotel or house of entertainment. The architect is Herr Rudolf Srnetz.

Books.

Stones for Building and Decoration. By GEORGE P. MERRILL. Third Edition. New York: John Wiley & Sons. London: Chapman & Hall, Ltd. 1903.

THE first and second editions of this well-known American text-book on building stones has already been noticed in our columns. The third edition before us is similar to its predecessors except that the chapter on methods of testing has been entirely revised; there is an additional chapter on the use of drift boulders for building purposes, and some new illustrations. It is with the new matter that we shall principally deal.

A satisfactory feature in the section devoted to the methods of testing building stone is that the author records his conviction that the history of tests should be carefully studied, as they yield information as to how far tests applied some years ago have been successful in proving the quality of stone for building purposes. It is definitely stated that the change of colour in a rock on exposure in a building is due mainly to a change in the form of combination of the iron. This is tantamount to saying that practically all building stones are coloured by iron in some form or another, and we do not think that the statement is quite justified by the facts. Many of our stones are coloured by manganese in certain districts, though, of course, iron is the most important mineral for colouring purposes. An interesting method of testing the permanency of colour as adopted by Professor J. A. Dodge is given, and the efficiency of the process is said to be fairly well established. Since, however, it consists of subjecting the samples of stones dealt with to very drastic chemical treatment, not at all compatible with the treatment they would undergo in the course of years in an ordinary atmosphere, we must discount many of the conclusions arrived at, though we know of no better means of artificially ascertaining permanency of colour in building stones.

In the tests to ascertain the resistance to corrosion, which were chiefly confined to calcareous rocks, Professor Dodge placed the specimens to be experimented with in water into which a jet of carbonic acid gas was run for several hours at short intervals. The action was continued for six weeks, when the specimens were removed, washed in pure water, dried, and weighed. The difference between the weight before this treatment and afterwards is held to indicate the amount of material dissolved by the carbonic acid water. Resistance to abrasion forms the subject of another section. We quite agree with Professor Merrill that a fairly accurate idea of the resistance to actual wear can be obtained by the rate at which the samples can be ground down on a common grinding bed, though results as at present given are not of much comparative value. Before they can be, it will be necessary for all experimenters to agree as to the size of the stone to be treated, the size of the face presented to the cutting medium, and the nature of the latter. The amount of pressure to be exerted on the stone whilst the face is being ground, the rate of feed, the amount of the cutting medium supplied during the operation, and the number of revolutions the cutting-table makes should also be recorded before any of the experiments relating to abrasion can have much practical value. Nothing is said in this section of the book concerning "rattling" tests as showing abrasion as applied to road metal.

Tests to ascertain the absorptive powers of stone are divided into two parts; one part deals with the determination of moisture from a damp atmosphere, and the other the amount of absorption of water through actual soaking. In regard to the latter, we pointed out some years ago that no experiment in regard to absorption can be of much use if the stone sample is completely immersed in the water, and that one face should always stand out a little above the water surface. We do not find that any such precaution has been adopted in the experiments detailed in this book. If the stone is placed entirely under the water the presence of the latter prevents the escape of air from the pores of the material to a large extent, and the results are proportionately vitiated.

We quite agree with the author that a high rate of absorption is more detrimental to a fine than a coarse-grained stone, for experiments have indicated that such stones are weaker, and will crush under less load when saturated with water than when dry. The power of a stone to resist the action of frost is, naturally, largely dependent upon its absorptive qualities, since it is the freezing of the absorbed moisture that commonly produces disintegration, especially in fissile stones. A coarsely porous stone will often withstand a freezing test better than one of fine grain, the expansive force resulting from the conversion of the water within the stone into ice finding relief outwards through the larger pores. Brard's well-known, but now discarded, process for ascertaining the effects of freezing by immersing the stone sample in sulphate of soda is described, as well as the modifications of it proposed by Mr. Page, but we need not dwell on the results, as few people nowadays have any faith in the practical value of such experiments. There is nothing like submitting the samples to actual freezing of the water in their pores, and thawing, the process being carried out several times and over a long period. Many such experiments have been carried out in Europe as well as in America, and several are recorded in this book.

The next section deals with methods of ascertaining ratio of expansion and contraction. Tests of this nature are of value for the purposes, first, of making proper allowance for expansion in parapet walls and similar situations, and secondly, because through expansion the tenacity of the stone is weakened. Within recent years some good work has been done in this direction under the supervision of the Ordnance Department of the United States army. The method of testing has consisted in placing carefully measured bars of stone in baths of cold water 32 deg. Fahr.), hot water (212 deg. Fahr.), and back to cold water once more. It was noted that in none of the samples tested did the stone quite regain its first dimensions on cooling, but showed a slight "permanent swelling." Since this can only mean that the particles composing the stone have separated, though ever so slightly, it is an important matter, as it necessitates a weakening which is shown by actual pressure tests.

We do not find anything new in the sections devoted to methods of testing the resistance of stones to crushing weights, or as to the means of ascertaining the elasticity of stone. The resistance of stone to shearing is a useful little section, but the experiments do not seem to have been of a very exhaustive character. In regard to the tests to ascertain the specific gravity of stone the book is certainly behind the times, and it does not take into account the means of arriving at the specific gravity of porous stones at all, except by the old-fashioned bell-jar and air-pump process.

We like that section relating to the testing of roofing slates, and we consider this to be the best all-round part of the book, so far as artificial tests are concerned. We quite agree with Professor Merrill that more can be learned regarding the lasting powers of a slate by microscopic methods than in any other class of rocks. We said so in these columns nearly twenty years ago, when hardly anybody took an interest in the application of the petrological microscope to the examination of building materials. The author remarks that the greater the amount of crystallisation the slates have undergone, and the nearer they approach crystalline schists in structure and composition, the tougher and more durable they are likely to be.

As already mentioned, the greater part of the work, as it appeared in previous editions, has already been noticed in our columns. As a text-book on American building stones it is pre-eminent, and it gives some account of the stone of other countries. It is full of interest from beginning to end, and bears the impress of most careful compilation and preparation. There is much in it to interest other than Americans, as a large part of the book deals with matters of general interest to all those who study building stones.

The Ventilating, Heating, and Management of Churches and Public Buildings. By J. W. THOMAS, F.I.C., F.C.S. London: Longmans, Green, & Co. 1903.

THIS little work of 140 pages claims to be a practical treatise showing the prevailing errors in the ventilation of churches, halls, schools, and other public buildings, and pointing out how the faults can be remedied. The author does not waste space on the elements of the subject or on abstract theories, but confines himself in the main to the results obtained by experiments and by practical experience. He shows the absurdity of the rules laid down by certain writers—chiefly doctors—as to the sizes of air inlets and outlets in systems of so-called "natural" ventilation. As an example, he quotes Dr. Parker's allowance of 3,000 cubic feet of air per person per hour, and shows that in a church 100 ft. long, seating 600 persons, the Tobin tubes (size 12 in. by 5 in.) must be placed close together throughout the whole length of both sides of the building, in addition to some at the ends, in order to supply this quantity of air at a velocity not exceeding 5 lineal ft. per second. The author is also of opinion that extract shafts are often too large, and that this defect is the cause of many of the down-draughts in public buildings. His remarks on cowls are well worth consideration, although they merely confirm what has already been demonstrated over and over again. The greater part of the book is devoted to natural ventilation, and the author advocates the inlet of warmed air at the floor level and the extraction of the vitiated air at the ceiling. The use of windows for ventilation is discussed in detail. One chapter deals with "mechanical and heat-aided ventilation," and the final chapter contains some very valuable "instructions for the caretaker." The author must be congratulated upon his success in writing an interesting and novel treatise on a difficult and hackneyed subject. Some of his statements are open to question, but the work as a whole may be recommended to architects and others as a wholesome corrective of some impracticable theories.

The Proportions and Movement of Slide Valves. By WILLIAM DYSON WANSBROUGH. Manchester: The Technical Publishing Co., Ltd. 1903.

THIS book, of which the subject matter originally appeared as a series of articles in *The Mechanical Engineer*, is neatly printed and bound. It contains a considerable number of problems, each with an appropriate solution, and relating to the practical design and arrangement of slide valves. The examples selected are clearly discussed and sufficiently illustrated by geometrical diagrams, but the arrangement and titles of the chapters in the body of the work do not accord with either the contents page or with the more detailed contents pages entitled "Index to Cases," and no real index is provided. These defects are quite sufficient to make the treatise quite worthless as a convenient and acceptable book of reference. In his preface the author says, "Some explanation of the reappearance of these articles in book form, so long after their original publication, may be offered." It might, therefore, be thought that he would have had sufficient time to arrange his material in a more orderly manner, and to correct or amend his proof-sheets with at least ordinary care. No explanation is offered concerning these points.

Society of Engineers Transactions for 1902. Edited by PERRY F. NURSEY, Secretary. London: E. & F. N. Spon. 1903.

ONE of the most interesting papers in the volume of Transactions which has lately been issued is a communication from a colonial member, Mr. Herbert E. Bellamy, upon "Australian Timber Bridges, and the Woods Used in their Construction." Very little attention is devoted to the first part of the subject, but there is a very complete description of various Australian timbers suitable for bridge construction, and for use in water or wet ground. Another paper in the same volume is upon "The Hennebique System of Ferro-concrete Construction," by Mr. A. de R. Galbraith. Unfortunately, the author confines his attention chiefly to descriptive matter which, although useful to a certain extent, is of very little service to the designer. Among the more practical remarks those chiefly

noteworthy are some upon the proportions of concrete and the qualities of iron and steel most suitable for use. Some data are also given on the adhesion of concrete, but the remainder of the paper, relating to the general principles and advantages of this type of construction, appears to be taken chiefly from the handbook issued by the Hennebique Company. The discussion following this communication is well worthy of perusal.

Technical Arithmetic and Geometry, for Use in Technical Institutes, Modern Schools, and Workshops. By C. T. MILLIS, M.I.Mech.E. London: Methuen & Co. 1903.

IN the course of his work at the Borough Polytechnic Institute the author has found that the teaching of artisans connected with the engineering and building trades is often difficult, because many students become disheartened by their unfamiliarity with mathematics. The object of the present book is to provide a connected course of arithmetic, geometry, and mensuration, so that students may equip themselves suitably for the reception of information upon technical subjects. The treatment adopted by Mr. Millis is very similar to that advocated for many years by Professor Perry, and his treatise somewhat resembles works on "Practical Mathematics" and "Practical Geometry" that have been reviewed in our columns from time to time. The chief point of difference is that the author confines his teaching to the simplest problems and calculations, such as those which are of daily occurrence in workshop practice. Throughout the work the rules are clearly and concisely stated, and most of the examples given are worked out both graphically and arithmetically, so that it should be impossible for any one of ordinary intelligence to miss the correct interpretation. Within the limits established by the author, this volume ought to be found of considerable service.

The Business Encyclopædia and Legal Adviser. By W. S. N. KNIGHT, Barrister. In Six Volumes. Vol. IV. London: The Caxton Press.

WE have now another volume of this useful, but rather too miscellaneous, encyclopædia. We could have done without the portraits of the successful men of business, which are out of place in such a book as this, for it is a work of reference, and one which certainly has its uses.

The Technical Dictionary-Cyclopædia. Edited by PHILIP R. BJÖRLING, C.E., and FREDERICK T. GISSING. Part I. Illustrated. London: Rebman, Ltd. 1903.

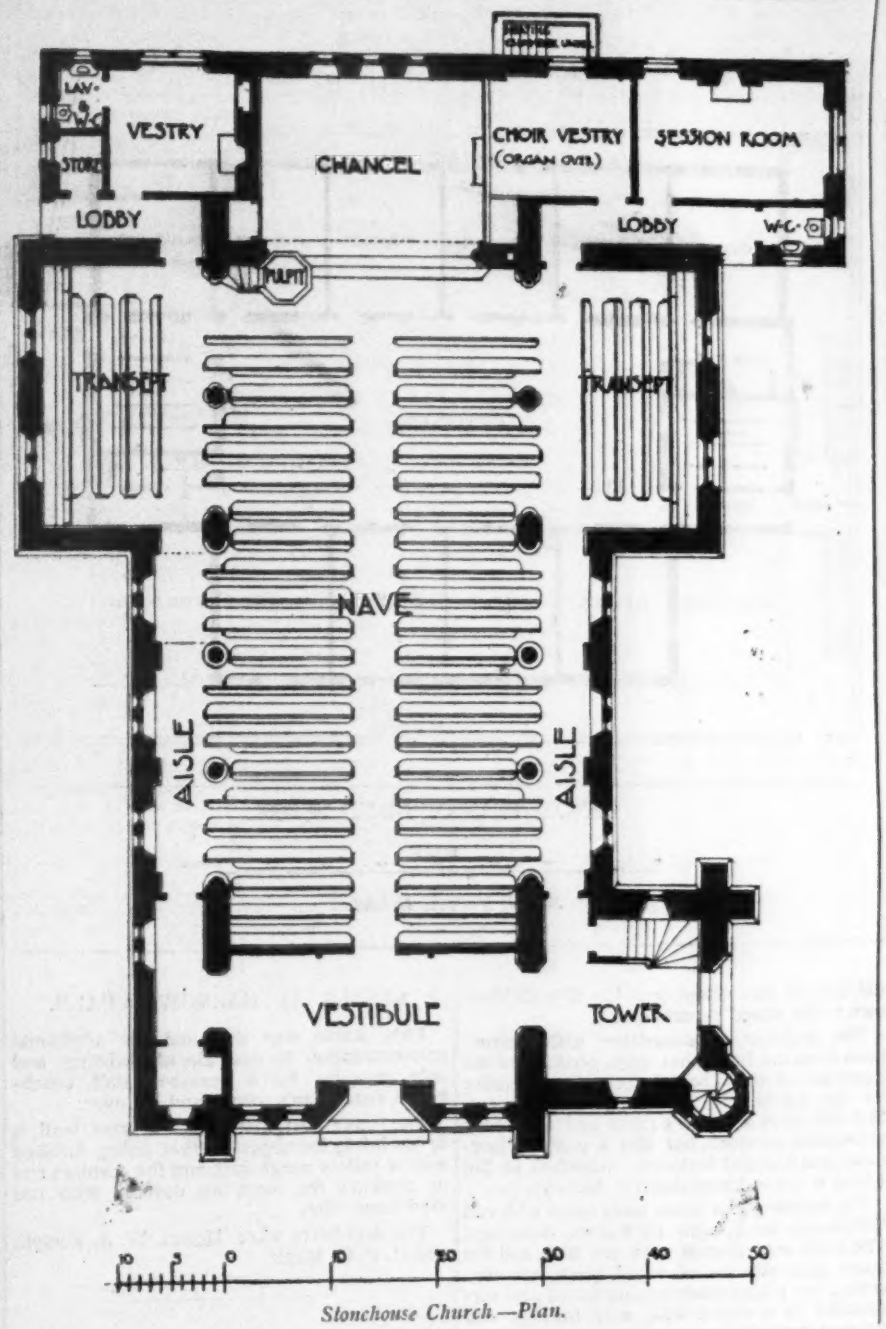
THE editors, in their "preliminary editorial notice," say that they have "many times been asked to recommend an English Technical Dictionary-Cyclopædia, and, after having made inquiries of several booksellers and publishers for a suitable work, have failed to find one"; they trust, therefore, that the new work "will be the means, in some way, of filling a vacant gap in English literature." We welcome the attempt, but are afraid that the vacant gap will not be entirely filled. The first part, which is all we have received, contains the definitions from "Abell's Furnace" to "Balance-gate," and we search in vain for architectural and building terms which certainly ought to have found a place in a "Technical Dictionary-Cyclopædia." Other professions and trades are similarly neglected. Indeed, it is difficult to understand upon what scheme the work has been prepared. We find acid, but not alkali; aërial railway, but not aërial navigation or aeroplane; atmosphere, but not air; bacteria, but not bacillus or amœba; artificial stone, but not asphalt; the A B C process of sewage treatment, but not the Amines; arc-lamp and acetylene, but not albo-carbon or Argand; air-tight stoppers for gas pipes and for the cleansing arms of drains, but not for testing drains; air-valve for water-mains, but not air-cock for hot-water warming apparatus. Mathematical terms, such as arc, abscissa, and asymptote, are not to be found. Some of the definitions are far from complete. Under anaërobes we look in vain for enlightenment as to obligate and facultative; and under analysis we find nothing about qualitative and quantitative. Other definitions are inaccurate; thus, under Aëration of filter-beds we read, "The filters at sewage works are aërated by compressed air"; certainly this method of aëration is used, but it is the exception, and not the rule; an automatic floating outlet is not synonymous with automatic tidal arm. We have not by any means exhausted our list of omissions, but those we have mentioned will, perhaps, be of use to the editors in showing some directions in which other technical terms may be sought.

Utility Fowl-houses and their Appliances. By H. FRANCKLIN. London: Dawbarn & Ward. 1903.

THIS is No. 4 of a set of small "Rural Handbooks," published at 6d. each, which contain a good deal of useful information and suggestion in regard to erections in connexion with the country house and farmyard. They are written apparently for country-house owners, but architects who are asked at times to make drawings for such things as fowl-houses may find some hints here as to what is required for the accommodation of fowls in comfort and in a healthy condition. The book is illustrated by numerous small diagrams of the structure and arrangement of fowl-houses, coops, and other such erections.

BOOKS RECEIVED.

MUNICIPAL ENGINEERING: MODEL ANSWERS TO QUESTIONS SET AT RECENT EXAMINATIONS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. London: St. Bride's Press, Ltd., E.C. Price 3s. 6d.



Stonehouse Church.—Plan.

Illustrations.

DESIGN FOR A TOWN CHURCH.

THE plan was worked out as suggested by the conditions, with a large central area and short sanctuary and nave. The lighting of the building is almost entirely from the upper part of the lantern, advantage being taken of the fact that two sides of the site were blocked by high buildings.

The morning chapel and vestries on the north side have top light. The organ is high up, on each side of the baptistry, and extends back over the vestibule. The domed roof of the lantern is carried by a steel cone springing from the top of the second stage.

F. C. MEARS.

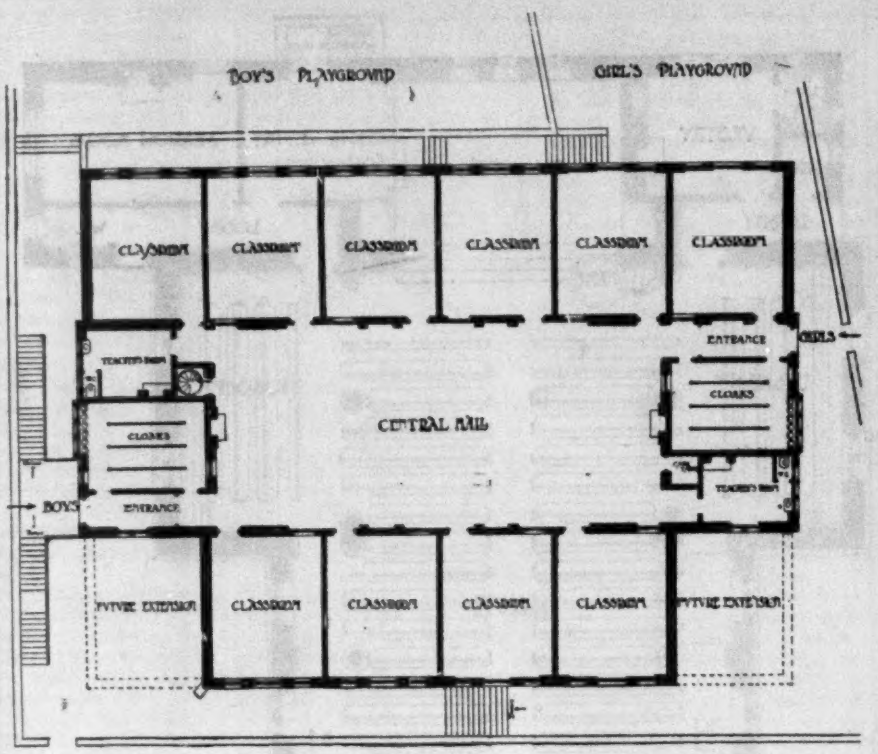
PARISH CHURCH, STONEHOUSE, LANARKSHIRE.

THE interior of this building is built of grey sandstone and the pews are finished in pitch pine. The glass throughout, with the exception of the chancel, is finished in clear quarries. The complete cost of the building was about 4,500*l*.

ALEX. CULLEN.

WELLS-ROAD BOARD SCHOOL, BRISTOL.

ACCOMMODATION is provided for 810 children (560 in the mixed department and 250 in the infants), and an enlargement is possible by the



GROUND PLAN OF MIXED SCHOOL.

SCALE

School, Knowle, Bristol.

addition of two classrooms for fifty children each to the mixed department.

The architect, in accordance with instructions from the Board, has made good use of the basement of the school by providing a centre for the teaching of household management. Not only have a cookery room and a laundry room been provided, but also a model sitting-room and a model bedroom. Attached to the school is a wood workshop for the boys.

The building has stone walls faced with red Cattybrook brick, with Bath stone dressings. The roofs are covered with red tiles, and the floors generally are of wood blocks on concrete; the playgrounds are asphalted and surrounded by a dwarf wall, with railings and gates of wrought iron.

One of the chief features of the scheme is the central hall of the mixed school, 80 ft. by 35 ft., which, in addition to educational purposes, can be used for public meetings of ratepayers, and for similar functions. The buildings are warmed on the low-pressure hot-water system, with ventilating radiators at convenient points, and an equable temperature is secured at all times.

The architect is Mr. H. Dare Bryan, Bristol.

CRESWELL INFANTS' SCHOOL.

ON reference to the plan it will be seen that the wing on the right forms the master's residence, and this portion, together with the central hall, formed the old school. The school-room has, however, been rearranged, and, with the addition of the central bay, and new windows on either side, now forms the central hall, the whole of the class-rooms, cloak-rooms, lavatory accommodation, &c., being new.

The exterior of the old portion is entirely stone, but the new has been built with sand bricks with stone facings, and the roof is covered with red tiles.

The boundary walls are old and have only had new gateways cut into them to suit the new entrances.

The building is at the corner of the road leading to Welbeck Abbey, and adjoining the same is the school erected by the same architects (Messrs. Brewill & Baily, of Nottingham) some three or four years ago.

STABLE AT HARROW WEALD.

THIS stable was designed for additional accommodation to one already existing, and only provides for a loose-box, stall, coach-house, coachman's rooms, and loft over.

The lower part, including the yard wall, is in red brick, the upper portion being finished with a yellow rough-cast, and the cornices run in cement; the roofs are covered with red sand-faced tiles.

The architects were Messrs. W. A. Forsyth and H. P. G. Maule.

WHITTON COURT, SALOP.

THE old hall, which forms the nucleus of the house, is plainly of the first half of the fourteenth century; but of the contemporary rooms and offices usually connected with the ends thereof there is nothing left. The entrance hall is separated from the hall by a very massive Elizabethan oak screen, which extends to the ceiling.

Towards the courtyard the hall retains its limestone facing. The elevations of the three other sides of the quadrangle were all of half timber work, in oak and plaster, the only one remaining being the one shown.

The old hall and the saloon over are wainscotted with oak panelling, the latter to the ceiling and the former to about two-thirds of its height, paintings on plaster occupying the remaining space; on the west side are three large shields with elaborate mantlings, on one of which are the initials, F. C. D., and date 1682; over the hall fireplace is a large picture of a stag hunt, with the south front of the Court in the background. The spaces on the other sides are occupied by paintings of pots of tulips and other flowers.

The saloon has an elaborate plaster ceiling, probably of the time of Charles II. The wainscotted walls are covered on three sides by Flemish worsted tapestry of the seventeenth century. Several of the rooms are wainscotted, and all have good but plain stone chimney-pieces.

The Court is about five miles from Ludlow Station and four miles from Tenbury, on the Great Western Railway.

HENRY E. FARMER.

Correspondence.

THE GAIETY THEATRE.—VANISHING LONDON.

SIR,—I see that the old front of the one time Strand Music Hall is in course of demolition. Whatever one may think of its architecture, it marked an alteration in the style of London street façades, and it was, I think, worthy of record among the delineations of vanishing London. Perhaps some of your readers have a drawing of it worth production. The notice of its opening thirty-nine years ago in Vol. XXII of the *Builder* is not a flattering one, and I cannot see any illustration of it subsequently. Mr. H. H. Collins was, it seems, associated with Mr. Bassett Keeling in the work.

It may be that the London County Council is having photographs and particulars taken of the buildings it demolishes in its various undertakings. With commendable forethought it caused a list of scores of houses (about to be taken down) to be sent to the R.I.B.A. sixteen months ago, asking if that body would assist in the work by supplying information on any of the addresses sent in the list. Many of them would have no interest, architectural or historical, but others most likely would be worth publishing. An account of the contents in the Spring Gardens Museum would also be interesting.

E. W. HUDSON.

A MONUMENT TO THE STONE FAMILY.

SIR,—In the *Builder* for the year 1859 appeared on p. 647 an article on "Notable People Buried in St. Martin's-in-the-Fields (old church)." It there gave a description of the monument erected in memory of the Stone family, 1647. For some time I have been endeavouring to find the whereabouts of this monument and the tablet with the profile of N. Stone's head, but without success. It is not in the present church nor the crypt. Do any of your readers happen to know if it is still extant, and also the monument in the same old church to Sir George Copen, executed by the same Nicholas Stone (senior about 1630?

ALBERT E. BULLOCK.

The Student's Column.

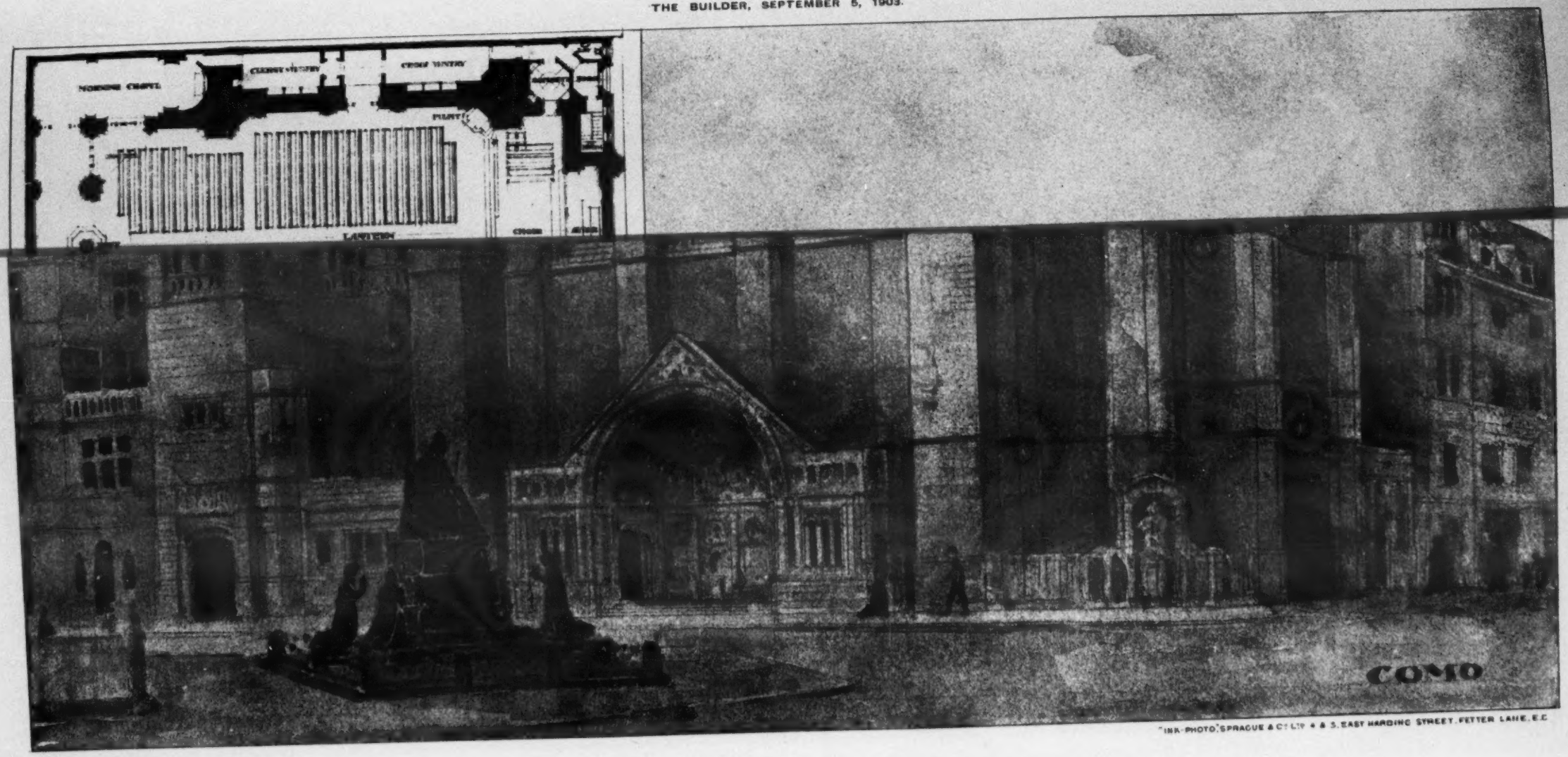
CONCRETE-STEEL.—X.

PROFESSOR HATT'S THEORY OF BEAM DESIGN.

IN the early part of the year 1902, Professor Hatt, of Purdue University, U.S.A., published a theory of the strength of reinforced concrete beams. More recently he has obtained experimental results that have enabled him to improve his previous theory, the records and conclusions drawn therefrom being described in detail in a paper read before the American Section of the International Association for Testing Materials of Construction. We do not propose to refer at length to the tests in question, but the following notes may be useful for the purpose of making the theoretical analysis more intelligible.

The beams tested were 8 in. square, and the clear span between supports was 80 in., the load being applied at the centre. Some of the beams were plain and others were reinforced. From several load deformation diagrams, presented in Professor Hatt's paper, it appears that the curve of deflection followed a nearly straight line up to a load varying from 1,500 lbs. to 3,000 lbs. for the beams tested. At higher loads the deflection increased more rapidly than the load, but the curve again straightened, so that the deflection once more increased uniformly with the load until a crack appeared at the lower surface of the beam. This point was reached with a load ranging from 4,000 lbs. to 10,000 lbs., and beyond it the deflection continued uniformly with the load until the reinforcement reached its elastic limit. Thereafter the deflection increased rapidly without any corresponding increase of load. It should be noted that there were three characteristic points:—(A) that at which the curve first deviated from the straight line, (B) that denoting the first crack in the concrete, and (C) that denoting the elastic limit of the reinforcement.

In none of the beams made with stone aggregate was any indication afforded that the compressive strength of the concrete had been reached at the point where the reinforcement failed. It should be said, however, that the metal used was iron, and the results would have been more interesting if steel bars had been adopted permitting the fuller develop-



DESIGN FOR A TOWN CHURCH.—By Mr. F. C. Mears.

Medal of Merit, Soane Medallion Competition, 1903.

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E. W. HUDSON.

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ALBERT E. BULLOCK.

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E-STEEL.—X.

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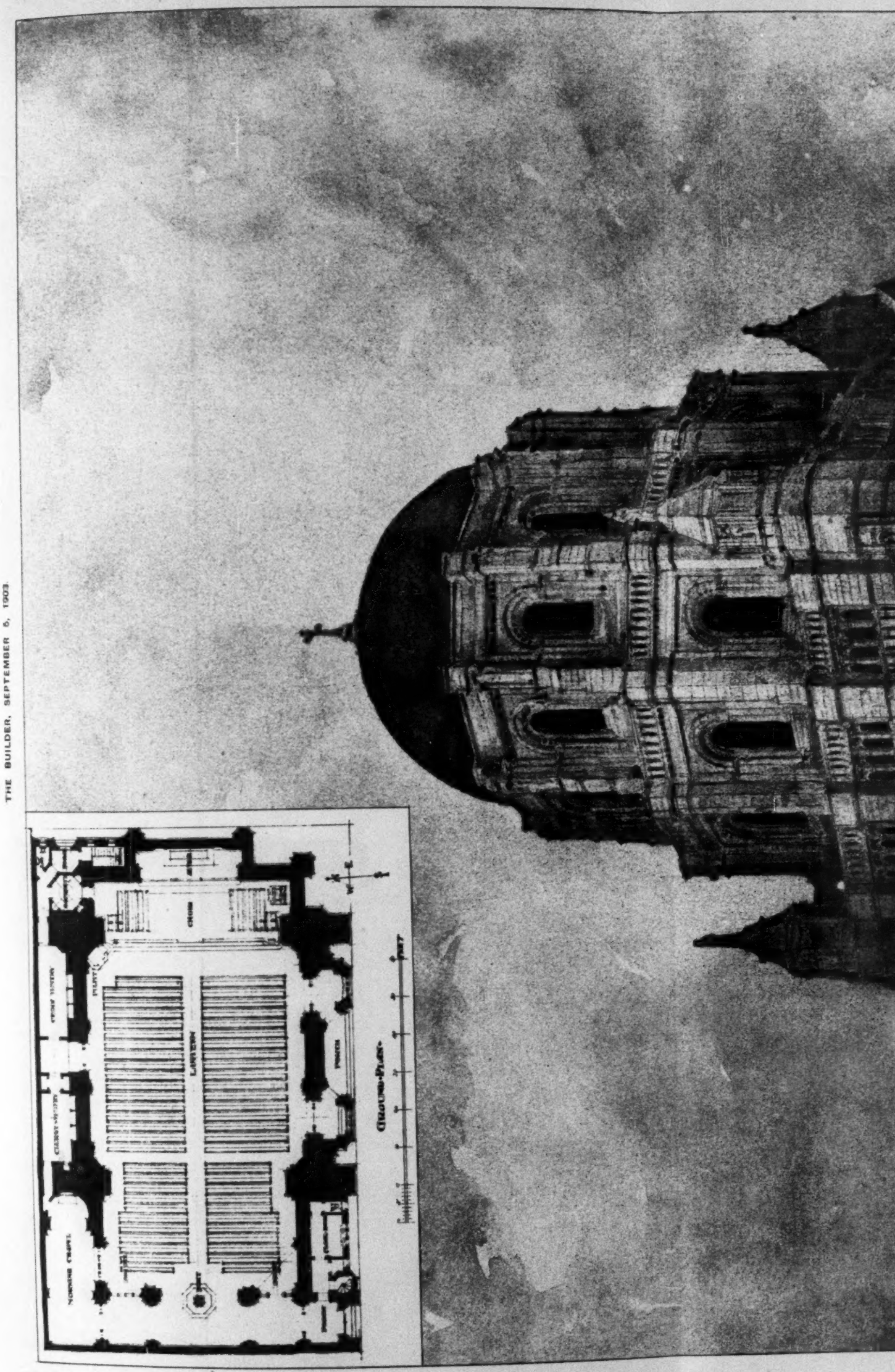
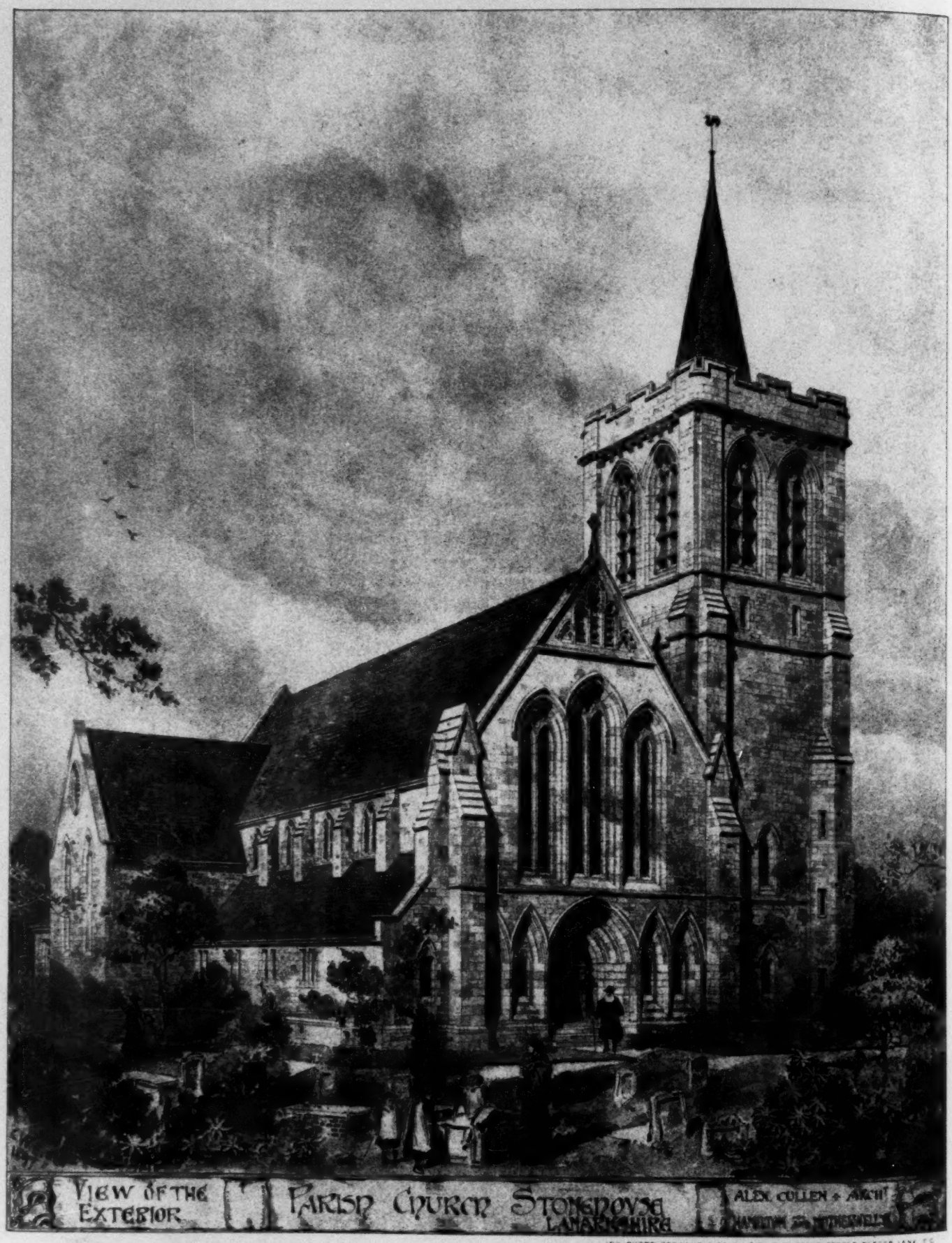


DESIGN FOR A TOWN CHURCH.—By Mr. F. C. Means.

Medal of Merit, Soane Medallion Competition, 1903.



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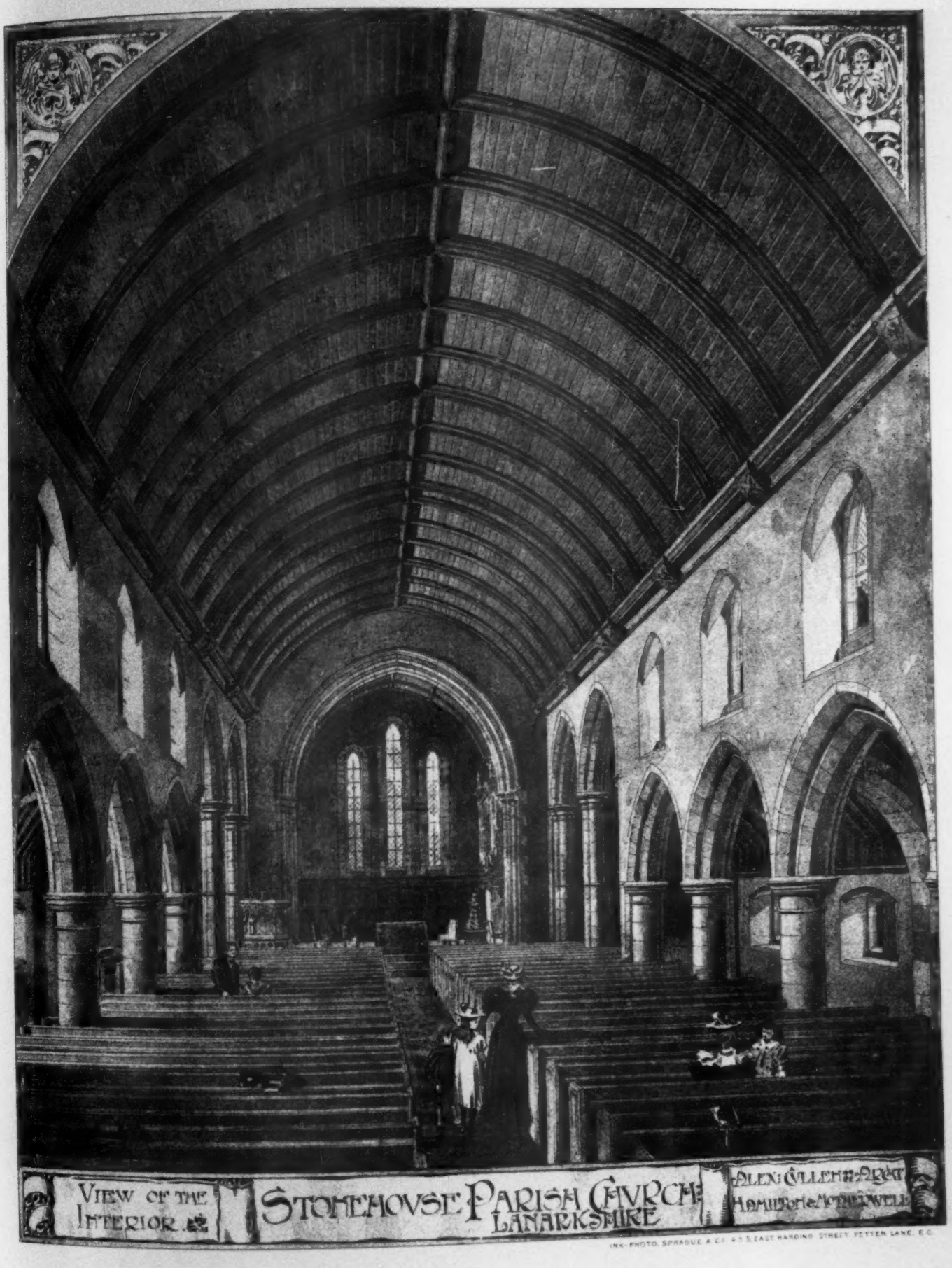

VIEW OF THE INTERIOR

STONEHOUSE PARISH CHURCH LANARKSHIRE

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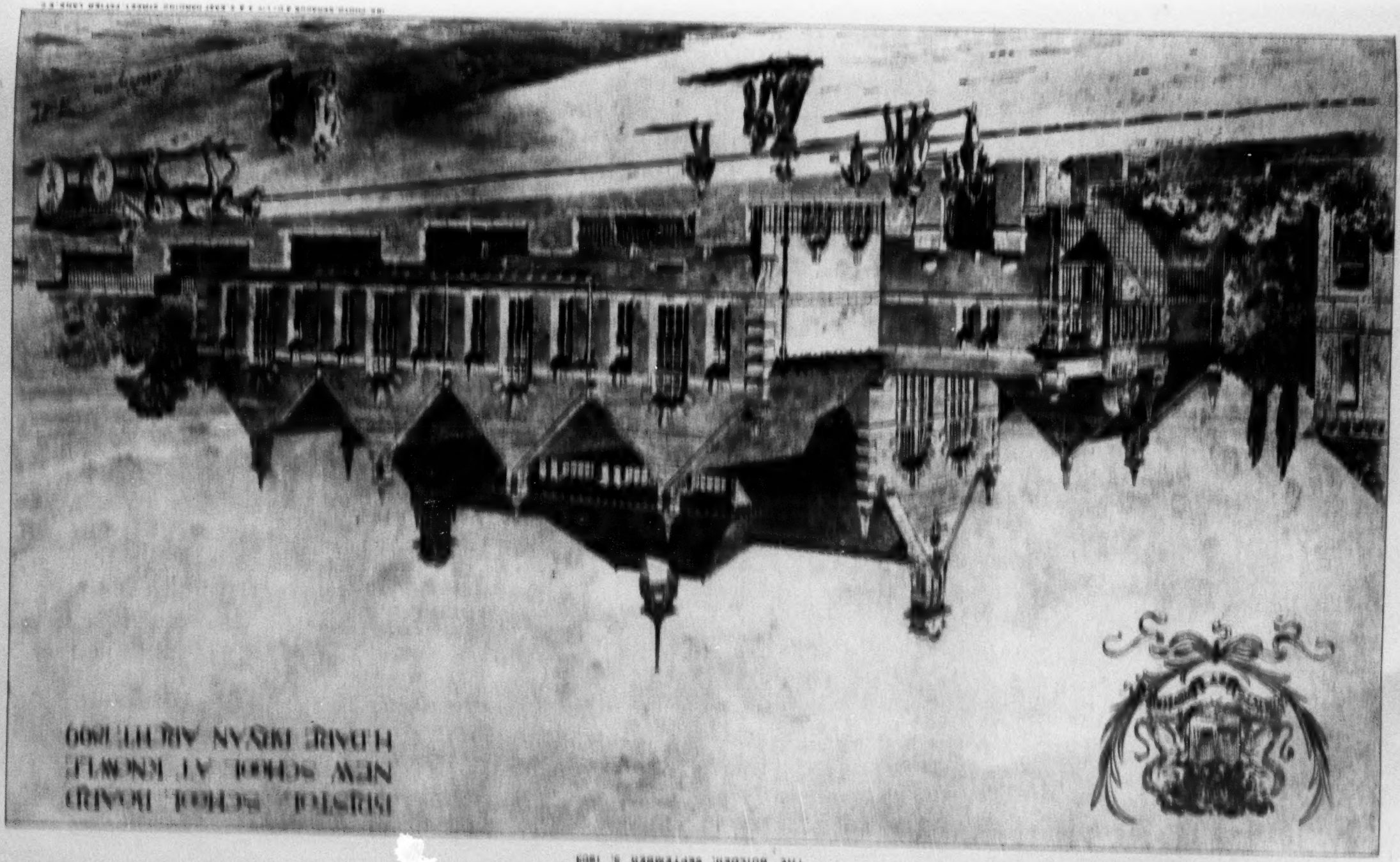

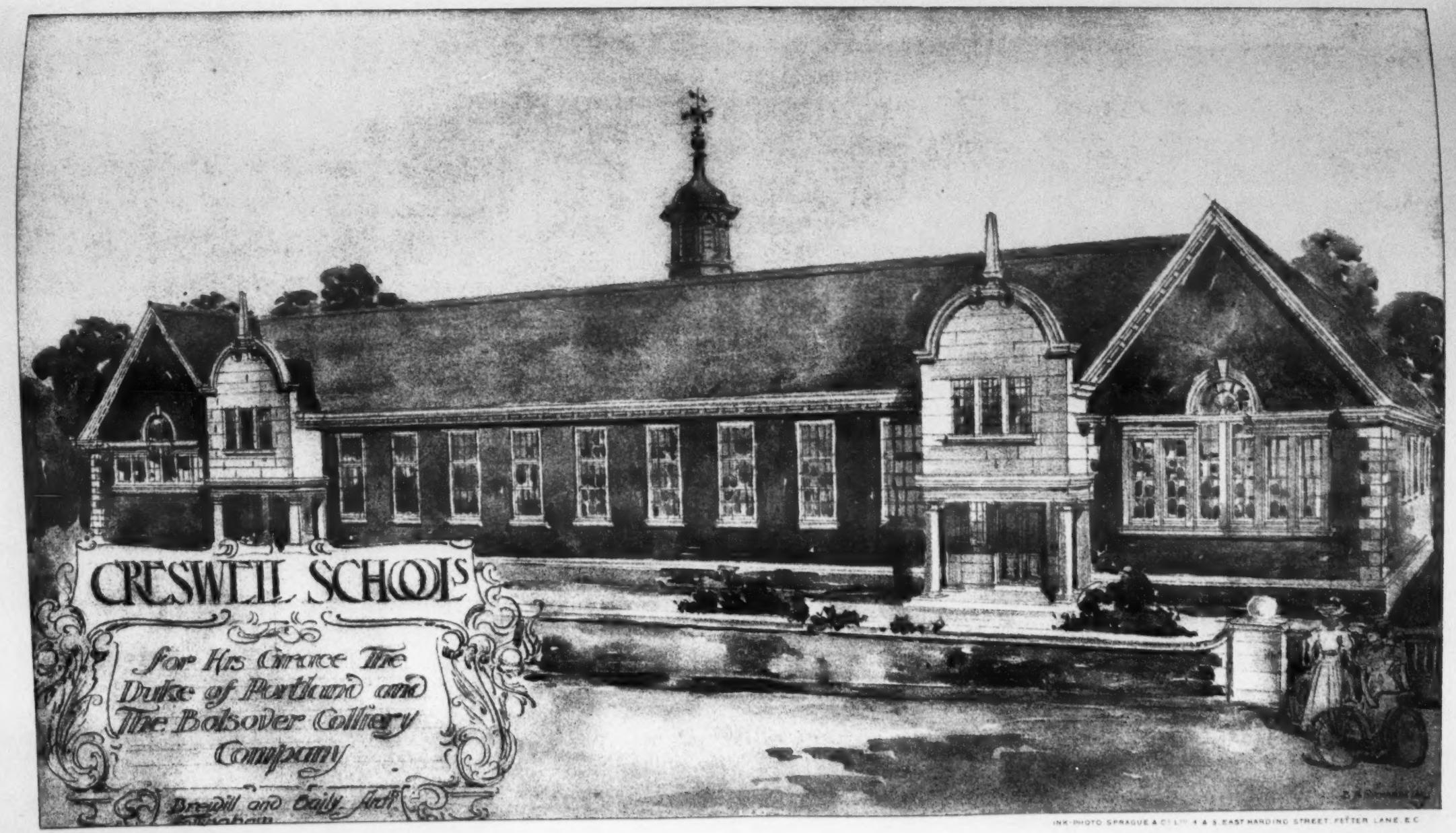

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BRISTOL SCHOOL BOARD
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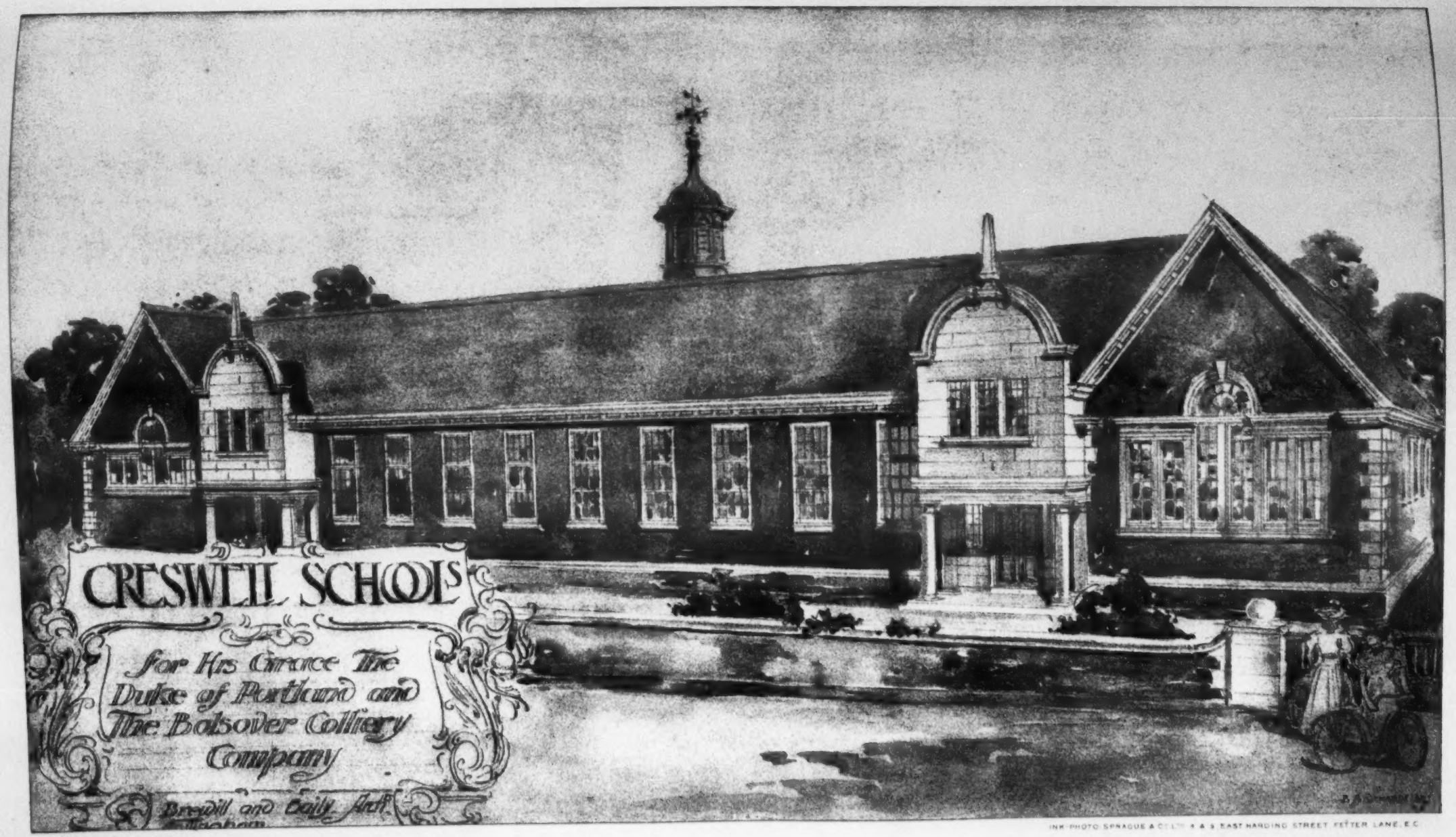

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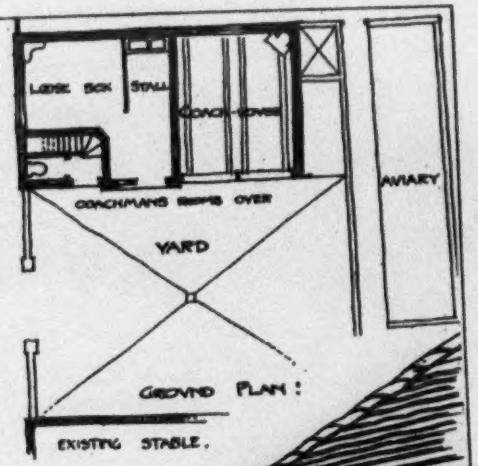

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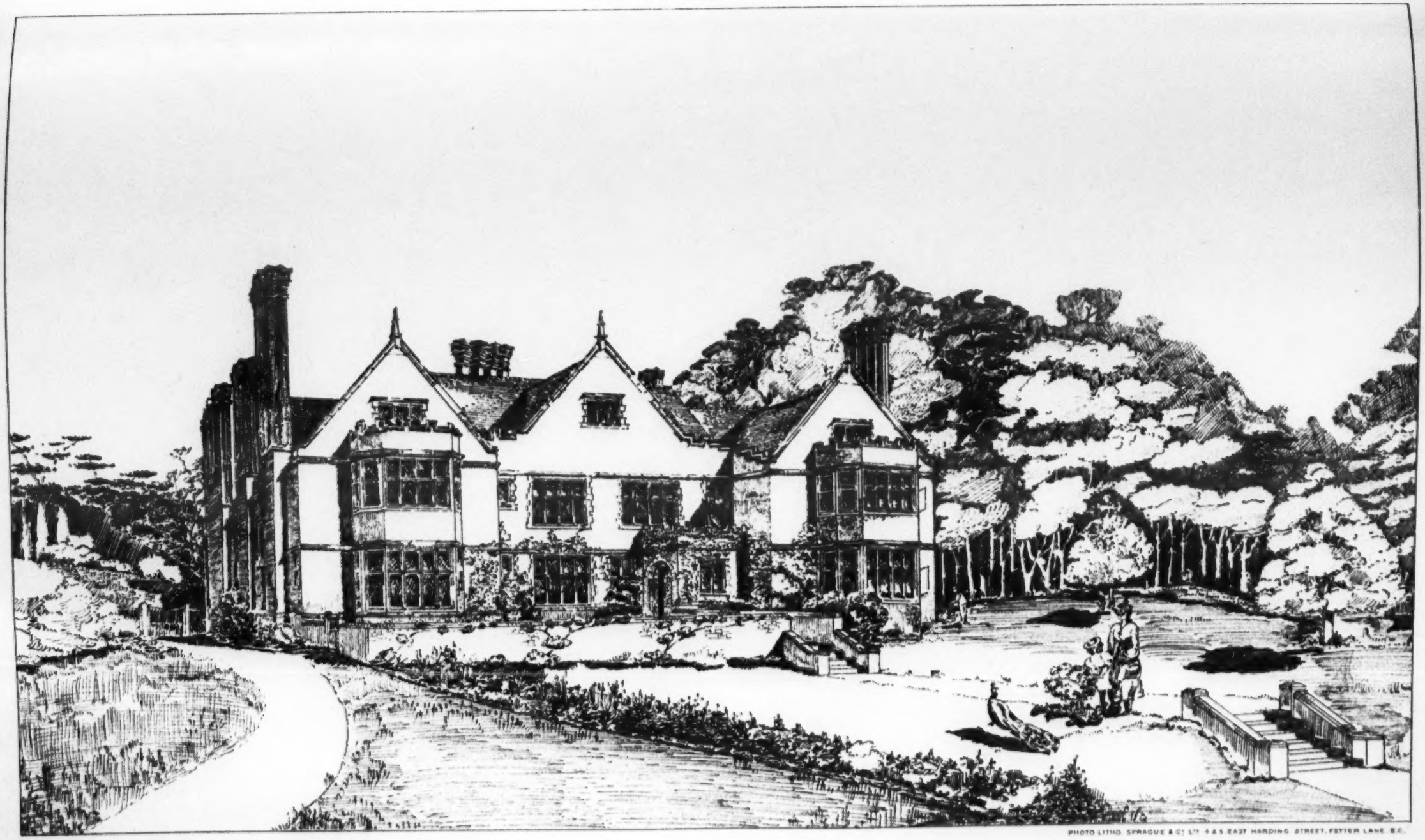
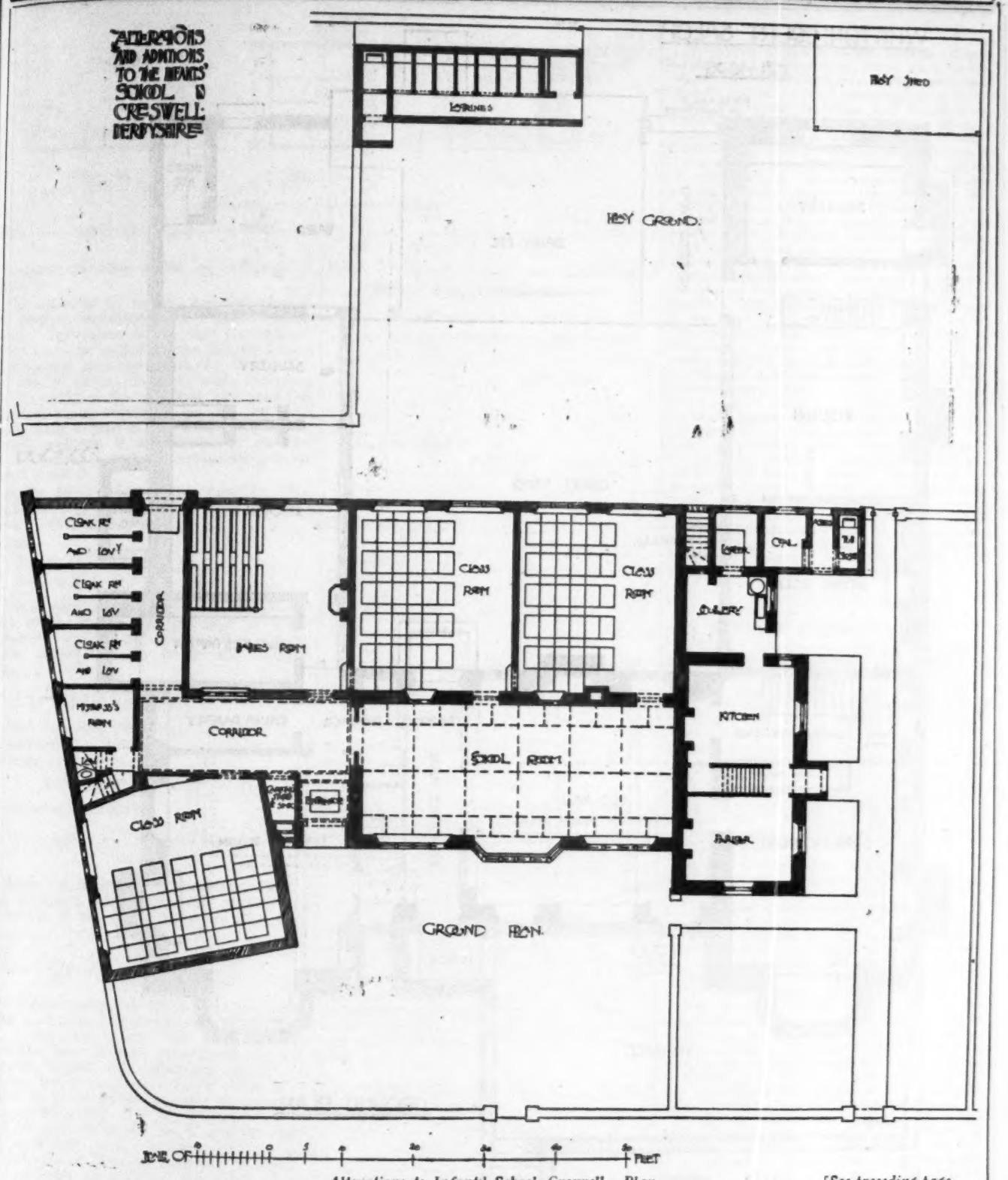


PHOTO LITHO SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

WHETTON COURT, SALOP.—Mr. H. E. Farmer, F.R.I.B.A., Architect.



Alterations to Infants' School, Creswell.—Plan. [See preceding page.

ment of the strength of the concrete in compression.

According to these tests, the ratio of the co-efficients of elasticity of concrete in compression and in tension was 2·17, corresponding with stresses of 750 lbs. per square inch in compression, and 300 lbs. per square inch in tension. Similarly the ratio of the co-efficients of the iron and the concrete in tension was 13·9, these values applying at the point A.

We have previously mentioned the influence of reinforcement in augmenting the extensibility of concrete, and it is interesting to observe that, according to the results obtained by Professor Hatt, while the concrete in the plain beams was ruptured with an average elongation of one part in 7,000, the reinforced concrete permitted an average elongation of one part in 1,140, before failure. The explanation suggested for this phenomenon is that the effect of the reinforcement is to distribute the total elongation over the whole length of the concrete, so that it is not confined to the fractured section, as in the case of simple concrete.

Assuming the tensile strength of the concrete at 300 lbs. per square inch, and the elongation at 1 : 1,000, the value of E_t for the reinforced concrete in tension was 300,000 lbs. per square inch. The value of E_c for concrete in compression at 1,500 lbs. was found to be about 3,840,000 lbs. per square inch, and the value of E_i for the iron bars was 29,000,000 lbs. per square inch.

Hence at the point B, the ratio of the co-efficients of elasticity of concrete in compression and in tension was 12·8, and the ratio of the co-efficients of the iron and the concrete in tension was 96·6.

Among other matters, enquiry was directed to the influence of varying percentages and positions of the reinforcement. The subjoined notes summarise the more important conclusions to be drawn from the records :—

One per cent. of metal in the sectional area, placed 1 in. from the bottom of the beam, raises the load-carrying capacity to more than 3 times, and flexibility to fully 10 times that of a simple concrete beam.

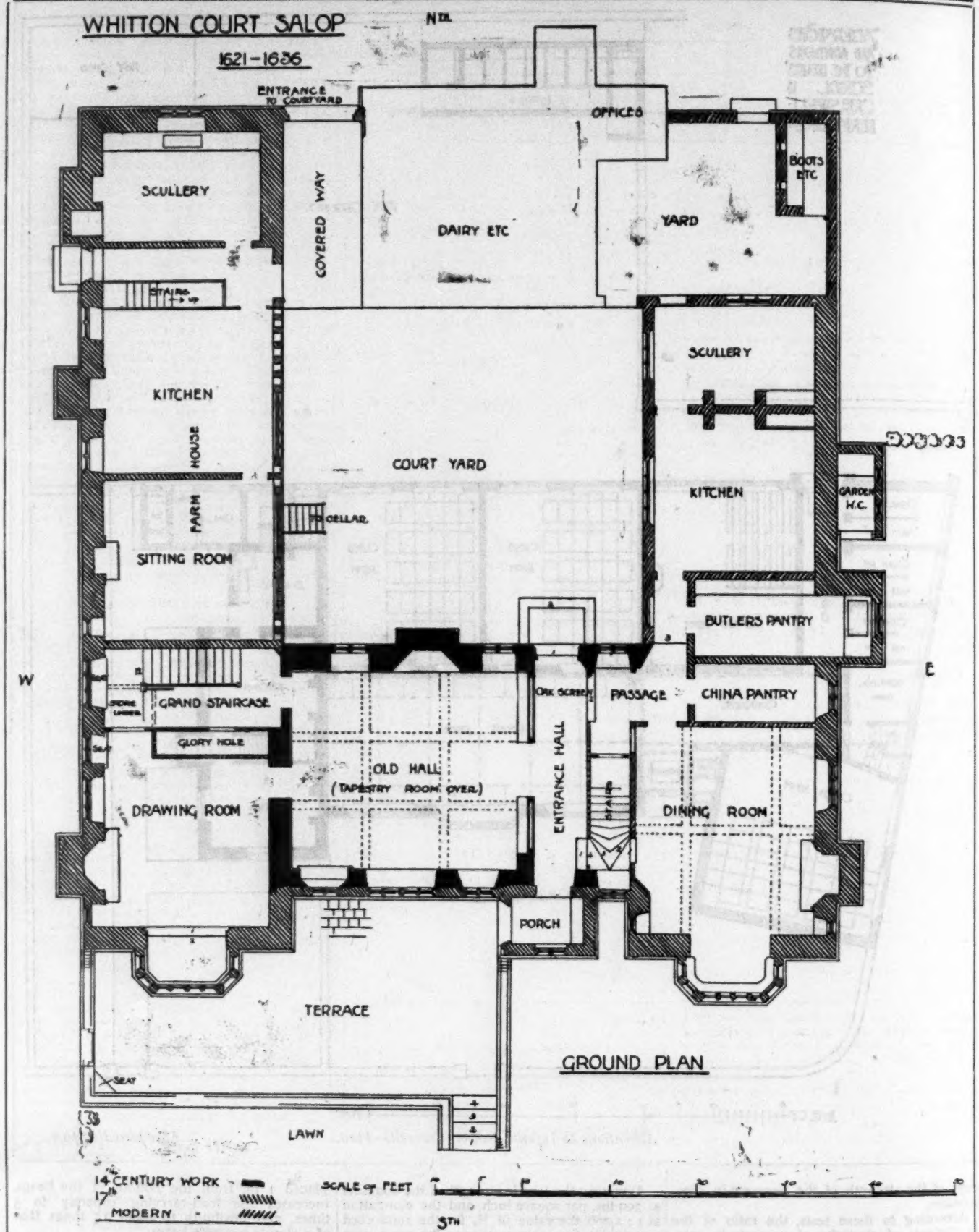
Two per cent. of metal in the sectional area, placed 1 in. from the bottom of the beam, increases the load-carrying capacity to 5 times, and flexibility to about 15 times that of a simple concrete beam.

One per cent. of metal in the sectional area, placed 2 in. from the bottom of the beam, raises the load-carrying capacity to nearly 2⅔ times and flexibility to 12 times that of a simple concrete beam.

Two per cent. of metal in the sectional area, placed 2 in. from the bottom of the beam, raises the load-carrying capacity to about 4½ and flexibility to 18 times that of a simple concrete beam.

The foregoing figures are only useful in a relative sense, for they do not imply the increase of strength that might have been obtained by the employment of steel instead of iron reinforcement.

Having established reliable data as the result of his experiments, Professor Hatt proceeded to amend his original theory and to ascertain how far it accorded with the newer facts brought to light. The theory is intended to account for the three characteristic points,



[See page 250.

A, B, and C, which are diagramatically represented in Fig. 16, and the main assumptions upon which it is based are the following :—

1. That the cross-sections of a beam remain plane surfaces after bending.

2. That the forces are applied perpendicularly to the neutral surface of the beam.

3. That the values of E_c and E_t obtained by tests for simple compression and tension will apply to the material when under stress in the beam.

4. That the bond between the materials is perfect.

5. That there are no initial stresses due to contraction of the concrete during setting.

Of course, it is necessary in connexion with every theory to make certain assumptions, but it is generally unlikely that the bases assumed will be entirely realised in practice. This is so in the case of the conditions now stated, but the resulting differences appear to be so small that they do not affect the substantial accuracy of the calculations.

Fig. 17 is a cross section of a concrete-steel beam, typical of those tested by Professor Hatt, and Fig. 18 is a part longitudinal section, to which are applied typical curves, as ascertained by Professor Hatt, representing compression in the concrete and tension in the iron at different distances from the neutral axis. For the purpose of avoiding unnecessary complication it is assumed that the curves are parabolic arcs. The following notation is adopted, and some of the symbols are shown in Figs. 17 and 18.

kx = distance of the upper fibres from the neutral axis.

ku = distance of the upper fibres to the centre of gravity of the reinforcement.

p = ratio of the cross-sectional areas of the metal and of the beam.

E_i = co-efficient of elasticity of the iron in tension.

E_c = co-efficient of elasticity of the concrete in compression.

E_t = co-efficient of elasticity of the concrete in tension.

$n = E_c \div E_t$.

$m = E_i \div E_t$.

f = tensile stress in reinforcement.

c = maximum fibre stress of concrete in compression.

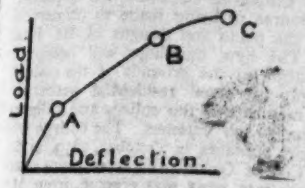


Fig. 16.

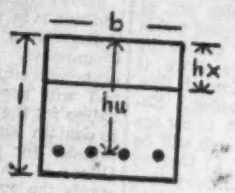


Fig. 17.

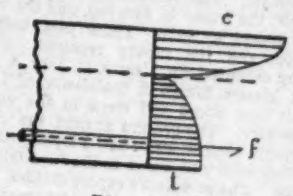


Fig. 18.

Illustrations to Student's Column.

t=maximum fibre stress of concrete in tension.

The values of E_c and E_t are measured at the stresses represented by c and t respectively. The values of x, u, and p are ratios; u and p can be settled by the designer, but x is dependent upon the values of p, u, n, and m, the two last factors being variable, according to the quality of the materials, and changing under stress, as previously pointed out, with the varying values of f, c, and t. In practical design, however, it is sufficient to use constant values of n, and m, corresponding to the points A and B.

In the development of his formulas, Professor Hatt proceeds first to determine the ratio of f to c, and of f to t.

Thus

$$c = t\,n\,x \div (1 - x) \ldots\ldots\ldots\ldots (1)$$
$$f = t\,m\,(u - x) \div (1 - x) \ldots\ldots\ldots (2)$$

For ascertaining the position of the neutral axis, which is given by the value of x, the forces of tension and compression on the cross section of the beam are equated. Thus:—

$$\tfrac{1}{2}\,c\,x = \tfrac{1}{2}\,t\,(1 - x) + p\,f \ldots\ldots\ldots (3)$$

Next, inserting the values of c and f as ascertained by (1) and (2), the equation is obtained:—

$$\tfrac{1}{2}\,x^2\,n = \tfrac{1}{2}\,(1 - x)^2 + p\,m\,(u - x).$$

Being solved, this gives

$$x = \frac{-[(4+3\,p\,m)+\sqrt{4n+9\,p^2m^2+p(6m\{u(n-1)+1\}}]}{2(n-1)} \ldots (4)$$

When the value of x is thus found, c and f are calculated, and finally the moment of resistance of the whole section is computed. Thus:—

$$R = tbh^2\left\{\frac{5}{12}(1-x)^2 + \frac{5nx^3}{12(1-x)} + p\frac{(u-x)^2}{1-x}\right\} \ldots (5)$$

The above formulas apply for computation of the load carried by a beam up to the point A. At the point B, the stress curve loses its parabolic form to some extent, and for very accurate results, the equations should be altered, but by adopting suitable values of n and m, as given above, the error in computation will be small. If it be desired to calculate the strength of the beam after the crack has developed and extended through the tension area, it becomes necessary to modify the formulas by omitting the effect of the tensile force resulting from the resistance of concrete in that portion of the section.

The position of the neutral axis is then found by the rule

$$2cx = 3pf, \text{ or } P\frac{E_t}{E_c}(u-x) = \frac{2x^2}{3}.$$

When f is assumed to represent the elastic limit of the reinforcement, the value of c may be calculated. The moment of resistance of the section is found by the following modification of the original rule:—

$$R = bh^2\left\{\frac{5}{12}cx^2 + pf(u-x)\right\}.$$

With the object of testing the correctness of his theory, Professor Hatt made a series of calculations, using the actual strengths of the constituent materials, as found by tests, and the previously stated values of n and m.

The tensile strength of the concrete was taken at 300 lbs. per sq. in., and the elastic limit of the iron at 36,000 lbs. per sq. in. A summary of calculated and measured results is given in Table XXII., by which it will be seen that the agreement between theory and experiment is fairly close.

Table XXII.—Theoretical and Experimental Results from Concrete-Iron Beams.

(Dimensions 8 in. by 8 in. Span 80 in.)

Note.—All calculated figures are printed in italics.

Index to Results.	Reinforcement. 1 per cent. Height from bottom. 2-in.	1-in.	2 per cent. Height from bottom. 2-in.	1-in.
At Point A.	lbs.	lbs.	lbs.	lbs.
Centre load.....	2,000	2,500	2,200	3,000
Stress in steel (t)	*2,103*	*2,266*	*2,400*	*2,648*
" " concrete (c)..	*2,000*	*2,700*	*1,950*	*2,700*
	457	*474*	*408*	*516*
At Point B.				
Centre load.....	5,000	6,500	5,750	10,000
Stress in steel (t)	*4,925*	*6,232*	*7,123*	*9,680*
" " concrete (c)..	*17,320*	*22,000*	*16,550*	*21,570*
	1,536	*1,680*	*1,937*	*2,188*
Centre load	5,500	7,300	10,250	12,000
Stress in concrete (c)..	*5,470*	*6,705*	*10,840*	*12,515*
	1,099	*1,810*	*3,050*	*2,710*

It must not be forgotten that the point C, although representing the failure of the beam, does not represent the ultimate strength of the concrete in compression, for, as already mentioned, the iron failed before the concrete gave any indication that its compressive strength had been reached.

Table XXII*a* gives the calculated heights of the neutral axis from the bottom of the beam. We state the figures in this way instead of giving the distance hx, as they will be more convenient to compare with previous references to the neutral axis. It should be particularly noted that the height of the axis varies, not only with the amount and disposition of the steel, but also with increase of load.

Table XXIIa.—Calculated Positions of Neutral Axis and Values of x for Beams in Table XXII.

(Height of beam 8 in.)

Reinforcement. Percentage.	Reinforcement. Height.	Height of Neutral Axis and Value of x. Point A. x	Point A. Neutral Axis.	Point B. x	Point B. Neutral Axis.	Point C. x	Point C. Neutral Axis.
			in.		in.		in.
1	2	0·433	4·536	0·302	5·584	0·272	5·824
1	1	0·441	4·472	0·318	5·456	0·298	5·616
2	2	0·454	4·368	0·354	5·168	0·337	5·304
2	1	0·463	4·296	0·378	4·976	0·382	4·944

Professor Hatt's formulas themselves may appear to be somewhat intricate for everyday use, but in many cases their direct employment could be avoided by the preparation of diagrams or tables from which the proportions of beams for various loads and spans could be found without the necessity for individual calculations.

OBITUARY.

PROFESSOR CORFIELD.—Dr. William Henry Corfield, of 19, Savile-row, W., whose death, in his sixtieth year, we briefly announced last week, was Sanitary Adviser to the Commissioners of H.M. Works and Public Buildings, and Professor of Hygiene at University College, London. He proceeded from Cheltenham Grammar School to Magdalen College, Oxford, and subsequently studied at University College, London, and the medical schools of Lyons and Paris. When twenty-five years of age he was appointed examiner for honours in the National Science School, Oxford University. During a period of six years he was a member of, and acted as reporter for, the British Association Committee upon the treatment and utilisation of sewage. In 1891 he originated the meeting in London of the International Congress of Hygiene and Demography. In 1901 he was awarded a medal by the Royal Society of Public Medicine of Belgium for his labours in the cause of public health. Professor Corfield filled many appointments, including those of Professor of Hygiene and Public Health at University College, London, Honorary Sanitary Adviser to University College and Hospital, President of the Epidemiological Society of London, Vice-president of the Sanitary Institute, and Past-president of the Society of Medical Officers of Health; he was also member of several foreign scientific societies. His numerous published works comprise—"Dwelling-houses: Their Sanitary Construction and Arrangements," "The Laws of Health," "Résumé of the History of Hygiene," "Disease and Defective Sanitation," which has been translated into French, Italian, and Hungarian, "Etiology of Typhoid Fever and its Prevention," &c. He served twenty years as Chairman of Committee of the Sunday Society for promoting the throwing open, upon Sundays, of public libraries and museums.

GENERAL BUILDING NEWS.

PRIMITIVE METHODIST CHURCH, HOLBROOK, DERBYSHIRE.—The foundation-stones have just been laid of a new Primitive Methodist chapel, at Holbrook, near Killamarsh. The erection will be about 50 ft. long by 35 ft. wide, and will be built in the Gothic style, with brick and stone dressings. There is to be a vestibule and a vestry at the rear, seating accommodation being provided for 280 persons. The rostrum and the furnishing will be of pitch-pine, and the chapel will be lighted with gas, and heated on the low-pressure hot-water system, which will be installed by Messrs. Truswell & Son, Sheffield. Mr. J. P. Earle, Sheffield, is the architect, and Messrs. J. Drabble & Son, Mosborough, are the builders.

CHURCH, CWMLLYNFELL, NEAR CARDIFF.—The foundation-stone of the new church to be erected at Cwmllynfell was laid recently. The new building will cost about 2,000*l.*, and accommodation will be provided for about 300 worshippers. The building has been designed by Mr. Jenkins, architect, Llandilo, in the Early English style, and the contractors are Messrs. Evans & Roberts, Brynaman.

WESLEYAN CHURCH, SAPCOTE, LEICESTERSHIRE.—The memorial-stones have just been laid of a new Wesleyan church at Sapcote, on the Leicester road. The cost of the new church will be 1,512*l.* 17*s.* Mr. Alderman Sawday, of Leicester, was the architect. The outside walls of the new buildings will be built of stones from the quarries in the district, given by Mr. H. J. Grace, of Enderby. The new church will provide seating accommodation for about 420, with the usual vestries, &c.

CHURCH AT SOUNDWELL, BRISTOL.—The foundation-stone has just been laid of a new church in the suburb of Soundwell. The architect was Mr. H. M. Bennett, of Bristol. The cost of the entire building is between 5,000*l.* and 6,000*l.*, but at present only about 2,500*l.* is to be incurred in the construction of the nave and north aisle. The church, when erected, will serve a population of about 4,000.

SCHOOL, INVERURIE, N.B.—A new public school has been erected at Inverurie, the walls of which are of blue granite from Burnside. There is a turret in which is to be placed a bell. The accommodation is for 670 school places, and there are eleven classrooms, each room accommodating on an average over sixty pupils. All the classrooms are lined to a height of about 4 ft. with varnished pitch-pine, and they are alternately painted in terra-cotta and soft green. The male teachers' room will be used as a boardroom for the meetings of the School Board. There is also a headmaster's room. The school is provided with a hall (90 ft. by 25 ft.), to be used for physical exercise, gymnastics, &c. All the classrooms enter from the hall, and all the sections—senior boys and girls and junior boys and girls—have separate cloakroom accommodation, and the various sections have wash-hand equipment, there being both hot and cold water circulation in the case of the junior boys' section. The building will be heated by steam. The contractors for the school were:—Mason work, Mr. John Smith, Kintore; carpenter, Mr. John Watt, Inverurie; slater, Messrs. G. Currie & Co., Aberdeen; plasterers, Messrs. Roger & Baxter; plumbing and heating, Messrs. James Laing & Sons, Inverurie; painters, Messrs. J. and S. Fyfe, Aberdeen; iron railings, Mr.

Wm. Simpson, Inverurie, and Mr. James Sinclair, Inverurie; laying out playground, Mr. Wm. Duncan, contractor, Inverurie. The contractors for the schoolhouse were:—Mason, Mr. Paul Ritchie, Inverurie; carpenter, Mr. John Buchan, Monymusk; slaters, Messrs. Currie & Co.; plasterers, Messrs. Roger & Baxter; plumbers, Messrs. Laing & Sons; painter, Mr. J. Masson, Aberdeen. Baillie Lauder was clerk of works, and Mr. A. Marshall Mackenzie, Aberdeen, was architect. It is estimated that the total cost will amount to between 8,000*l.* and 9,000*l.*

MIDLAND HOTEL, BIRMINGHAM.—The Midland Hotel in New-street has been reopened after extensive alterations. Some portions of the shell of the old building remain, but the interior is new. The building of the new portion and the remodelling of that part of the old structure which has been retained have represented a cost of between 80,000*l.* and 90,000*l.* The new building, which contains upwards of 170 bedrooms, has main entrances from New-street and Stephenson-street, and separate entrances for the members of the staff, tradesmen, &c. A feature in the entrance-halls and ground-floor rooms is the free use of marble. The main staircase, which is composed of Sicilian marble, leads to the several suites of private rooms, bedrooms, and principal portion of the hotel. The stockroom accommodation comprises some twenty-two apartments. The rebuilding has been carried out from the plans of Messrs. Henman & Cooper, the contractors being Messrs. John Barnsley & Sons, Ryland-street, Birmingham.

PRESBYTERIAN CHURCH, LARNE, IRELAND.—In connexion with the Reformed Presbyterian Congregation, Larne, a memorial stone was laid on the 25th ult., at the new church. This new building is being erected on the Curran-road, adjoining the new Victoria Orange Hall. The interior dimensions of the building are 50 ft. by 32 ft., whilst the height to the eaves is 18 ft. The total seating accommodation of the church will be about 330. Behind the church are situated a minister's room and a session-room, divided by the heating chamber. Mr. J. Scott, Belfast, is the architect for the new building, and Mr. Hewitt, Ballyhackamore, the builder.

POST OFFICE EXTENSION, NORWICH.—Norwich Post Office is being extended, the architect for the work being Mr. W. T. Oldrieve, F.S.I., of H.M. Office of Works, while the supervision of the building operations is being exercised by Mr. W. T. Bowman, from the same office. In Crown-road is the main elevation of the building, and in King-street the other elevation. The total length of the Crown-road extension is about 98 ft., the height from the ridge of the roof to the street being 56 ft., whilst the basement goes 11 ft. lower. The King-street extension is about 72 ft. in length, and is two stories high. The width of the new portion of the whole building is about 70 ft. Both elevations are in stone, the lower portion in Portland stone and the higher portion in Bath stone. The structure comprises practically four stories—three floors, the new portion consisting of the basement, the ground floor, first floor, and the second floor. The basement has been formed by excavating practically from the level of Crown-road to King-street. At the end of the Crown-road elevation an entrance for mail vans into the loading platform is provided. The sorting office will be on the ground floor, the postmens' sorting-room on the first floor, and an instrument room on the top floor, whilst on the King-street side of the basement will be a caretaker's department overlooking the street, with accommodation for packages, and storage for batteries in connexion with telegraphy. Extra accommodation has been provided for postmen in the shape of retiring-rooms, and separate rooms will also be set apart for female and male telegraph clerks. The chief contractor is Mr. G. Hawes, of Norwich. The sub-contractor for plastering is Mr. W. Bullock, of Norwich.

RESTORATION OF WYMONDHAM ABBEY CHURCH.—This building is being restored at an estimated cost of 25,000*l.* The roofs will be carefully repaired, the lead being re-cast and relaid, and every piece of the old carved and other timbers retained as far as possible. All the floors of the church will be relaid at their original levels, the walls and windows thoroughly repaired, the large west windows in the west tower and north aisle re-opened, the seating improved, and proper lighting and warming apparatus provided. At the east end of the nave, which is at present entirely blank, will be a reredos of stone surmounted by a fresco of suitable design. Below the sanctuary there will be carved oak choir and clergy stalls, and also a chancel organ. The grand arch dividing the west tower from the nave will be opened up by the removal of the modern gallery and partition. The organ, presented in 1793, must be rebuilt and enlarged, and will then be placed on a screen, already indicated in the west tower, under a new vaulted groined ceiling (the original corner fan-shaped springers being still in existence). The choir vestry will be built on old foundations, and a clergy vestry built in the base of the eastern or abbey tower, to preserve the ancient north and south doorways, as well as the doors from the sanctuary, which were bricked up, and will be reopened. There are five bells in the west tower, but they have not been "rung" within the memory of man owing to their unsafe condition. The tenor weighs 28 cwt., and is of fine tone; the second bell is cracked, and must be recast. The remaining bells are also out of repair, the frame is decayed, and the ringing tackle has ceased to exist. Three new bells are to be added, and the others repaired. This work is being executed by Messrs. G. Day & Son, of Eye, and Messrs. Mears & Stainbank, of London. Entirely new floors and steps in the west tower are necessary. The ground around the church will be properly cleared away and a trench laid, so that no further injury by damp to the foundations may take place. The architect's report divides the work into sections, so that the various parts may be taken up as funds are forthcoming. The work has been begun in the nave and south aisle by the restoration of the beautiful roofs and the windows, walls, and floors, the opening out of the west end, and also the preservation of the eastern or abbey tower. The contractors are Messrs. Rattee & Kett, of Cambridge. Plans for the work were prepared by the late Mr. W. S. Hicks, of Newcastle, and he himself superintended the earlier part of the work. Since his death his plans have been carried on by his partner, Mr. H. C. Charlewood.—*Norfolk Evening Standard.*

CONGREGATIONAL CHURCH, WIGAN.—St. Paul's new Congregational Church, Wigan, was opened on the 26th ult. The new church occupies the site of the old structure in Standish Gate, with extensions in the rear. It provides accommodation for 750 persons, and the cost amounts to about 6,000*l.*, the architect being Mr. F. W. Dixon, of Manchester, and the contractors Messrs. J. Wilson & Sons, of Wigan

COURT HOUSE, HENLEY-IN-ARDEN, WARWICKSHIRE.—The new Petty Sessions Court House at Henley-in-Arden, which has been erected from plans prepared by the Warwickshire County Surveyor at a cost of 2,000*l.*, was opened on the 26th ult. The new Court House, which has been erected at the rear of the police station, is a building of red brick. There is a police-court, a magistrates' retiring room, police offices, cells, and lavatories.

SCHOOLS, CLUTTON, SOMERSETSHIRE.—The new school buildings which have been provided at Clutton were opened on the 28th ult. Accommodation is provided for 340 children, being 180 in the mixed department and 160 in the infants' department, the plan admitting of future extensions if desirable. The main schoolroom for the mixed department measures 45 ft. by 22 ft., and will accommodate two classes, each of forty children. The classrooms for this division open immediately from the schoolroom, and are respectively, 27 ft. by 18 ft. 6 in. and 27 ft. by 20 ft. in dimension. In the centre of the building is placed the managers' room, facing the main road. This room will also be utilised as a retiring room for the teaching staff. The infants' division consists of a schoolroom 45 ft. by 22 ft., and a classroom fitted with a gallery for the use of very young children. A free treatment of Gothic has been adopted for the elevations. The teacher's residence has been built facing the schools on the opposite side of the road. The total cost of the buildings, inclusive of water supply and heating apparatus, has been about 3,700*l.* The contractor for the schools was Mr. Flower, of West Harptree, and the architect Mr. W. F. Bird, Radstock.

CHURCH, TRAIANGLAS.—The Bishop of St. David's recently consecrated the new chancel and vestry of St. Mary's Church, Trailanglas, Breconshire. The work was carried out by Messrs. Walters & Johns, contractors, Morriston, from plans prepared by Mr. Moxham, architect, Swansea.

A NEW (BOARD) SCHOOL FOR THE DEAF, OLD KENT-ROAD.—Plans have been prepared by Mr. T. J. Bailey, Architect to the School Board for London, for the adaptation of the old premises at the corner of Townsend-street, Old Kent-road, to serve as a centre for physically defective children in lieu of the one previously proposed at the Surrey-square school, with a day centre for deaf children on the first floor, and rooms for the divisional staff and the local clerk of works for repairs on the second floor. The freehold premises of the Royal Deaf and Dumb Asylum, standing between Mason and Townsend streets, Old Kent-road, and covering an area of 28,500 ft. superficial, were sold for 16,750*l.* on October 9 last year, consequently upon the migration of the asylum to Margate, where a branch was opened nearly forty years ago. The charity was founded in 1792. The buildings in Old Kent-road were begun in 1807, and having been extended for 300 inmates in 1819, were rebuilt in 1886-7.

PALACE THEATRE, NEWCASTLE.—This building has just been reopened after alterations. The scheme has been carried out from the designs of Mr. J. Walton Taylor, architect, Newcastle, and superintended by Mr. P. R. Donald from the architect's office. The constructional work and mahogany fittings have been carried out by Mr. F. J. Hepple, Newcastle; the fibrous-plaster decorations, carpets, and upholstery by Messrs. A. R. Dean & Sons, of London and Birmingham; the ornamental copper grilles by Messrs. Hardman, Powell, & Co., of Birmingham; the brass and iron division rails by Messrs. Henry Walker & Sons, of Newcastle; the brass and copper handrail in entrance, marble stairs, and fire hydrants by Messrs. Emley & Sons, Ltd.; the electric fan and ventilation and electric lighting by Messrs. Rowland, Barnett, & Co.; the bevelled plate glass and mirrors by Messrs. Reed, Millican, & Co., Newcastle; the stained glass by Messrs. Davison & Walker; and the painting and decoration by Mr. Matthew Alexander, Newcastle.

SOMERVILLE COLLEGE, OXFORD.—An important addition is in course of being made to Somerville College, after the plans and designs of Mr. Basil Champneys. The new buildings will occupy a prominent situation in the grounds of the college, and will supply increased residential accommodation for the members of the college and a library to contain some 30,000 volumes. The college was founded for girl students in October, 1879, in St. Giles's, in the City of Oxford, and three years afterwards the south-east wing was erected, from Mr. T. G. Jackson's designs, at a cost of about 2,500*l.* In 1887-8 were added the new buildings in Walton-street, comprising the dining-hall, gymnasium, a library, and large drawing-rooms, the architect being Mr. H. W. Moore, who also prepared the plans and designs for a further extension, made ten years ago, on the west side of the buildings, providing new lecture-rooms and "rooms" for nineteen students.

ISOLATION HOSPITAL, STONEHAVEN, N.B.—The formal opening of the new Infectious Diseases Hospital at Stonehaven took place on the 29th ult. The architects were Messrs. Brown & Watt, Aberdeen, and under them have been the following contractors:—New road and water and gas, Messrs. Peters, Bervie; masonry and joiner work, A. Gordon & Son, Montrose; plumber work, Blaikie & Son, Aberdeen; plaster and tile work, Maitland & Son, Aberdeen; painter work, Lamb & Son, Aberdeen; electric bells and telephones, Claud Hamilton, Ltd., Aberdeen.

BO'NESS ACADEMY, LINLITHGOW.—The Bo'ness Academy, which has just been completed at a cost, including the price of furnishings, of 7,000*l.*, takes the place of the Anderson Academy. The new academy occupies a site known as Williamson's Land, situated to the east of, and adjoining, Bo'ness Public School. The building faces Stewart-avenue, and accommodation is provided for 360 scholars. All the classrooms open from a central hall, 48 ft. by 22 ft. On the south side are four classrooms to accommodate 200 pupils, and on the north side three rooms for 160 pupils. The heating of the school is by hot air. The architect was Mr. Alex. Cullen, of Hamilton.

MIDLAND HOTEL, MANCHESTER.—The new Midland Hotel at Manchester has just been completed. Over 1,500 men have been at work for some time with the object of finishing the undertaking before the end of the summer. The site covers about two acres and is surrounded by open streets. The building is ten stories high, and contains 480 rooms, including public rooms for meetings, lectures, concerts and balls, in addition to the usual public and private dining-rooms, restaurant, &c. The general contractors were Messrs. Brown & Son, of Salford. Messrs. Mark Fawcett & Co. have constructed the fireproof floors, ceilings, and roofs at the rate of 1,000 yds. per week; the Banks' Syndicate have incased the main girders with their helical lathing; the London Fireproof Plate Wall Co. have constructed the internal partitions, and every effort has been made to render the building as fire-resisting as possible. A general description of the building was given in our issue of January 24 last (p. 95). Mr. Charles Trubshaw, the Company's architect, has acted throughout, and the completion has been superintended by Mr. Rodgers.

FOREIGN.

INDIA.—A new diversion is to be constructed at the Bansra station on the Eastern Bengal railway, and the estimated cost is 30,000 rupees.——The construction of a single line between Dum Dum and Sinthee, on the same railway, has also been sanctioned at a cost of 40,000 rupees.——The preliminary survey of the proposed line from Podanur to Palni by the Madras railway, for the Government of India, is well in hand, and a great deal of work has already been accomplished.——The strengthening of the girders of Chevar bridge on the North-western line of the Madras railway by inserting central masonry piers for four spans and replacing the other spans by new girders will be taken in hand and completed this official year.——Buildings are to be erected at Maymyo and Mandalay Hill for British soldiers, at a cost of about 10½ lakhs of rupees.——It is expected that the electric tramway lines now being constructed in Mandalay will be open before the end of the present year.——The Home Board and the Government of India have both sanctioned the construction of large additions to Magra station on the East Indian railway.——It is contemplated to use crude oil to lay the dust on important roads in Bombay.——The Bombay Port Trustees have decided to apply to Government for sanction to raise a loan of 252 lakhs of rupees for the construction of the new docks at Bombay.——Important architectural works are to be carried out in Indore, under the superintendence of Mr. C. F. Stevens, architect, of Bombay. Amongst other works, the Sherpur Palace is to be completed as a residence for the young Maharaja, the Rampur Kothi is to be rebuilt in elaborate style, and a new Residency is to be designed and erected.——Two lakhs of rupees, part of a sanction of 4½ lakhs, are to be immediately expended by the Port Trustees of Karachi on the general improvement of the port.——The military and railway departments at Sibi have arranged to execute a water supply

scheme on the combined principle, and the work is already in hand.——The Indian Government has sanctioned the retention of the establishment for the Howrah and Rajapore drainage scheme for another five years.——The Indian Government has accepted a scheme for establishing a central workshop and store at Rurki for the repair and testing of electrical appliances, and for the issue of stores required in connexion with electrical installations in cantonments.——A school house and quarters for teachers are to be constructed at Negapatam.——New station buildings are to be erected at Latteri on the Madras railway.——The Viceroy's prize at the Simla Arts exhibition this year has been left unawarded in the absence of any picture of sufficient merit.

GERMANY.—The memorial to Prince Bismarck in the new cathedral near the Castle in Berlin, has been completed in the clay by Reinhold Begas, and is accepted. It will stand against a wall between two square pillars with florid Ionic capitals. The centre of the panel shows Prince Bismarck seated and draped on a pedestal. Immediately in front is an ornate sarcophagus, with low relief on its long front. To the right of the sarcophagus is a half-draped youth, a male "Fame," who holds a long trumpet to his lips with his left hand, and with the right raises a drapery from the tomb. To the left is another half-draped figure, a female, "Muse of History." Under the flowing drapery of Bismarck one sees that he is clad in a suit of mediæval armour. His right fist is against his right knee, and his left hand lies on his left knee. The head is turned slightly to his right. On the tomb front an enthroned Germania is carved, who is receiving the crown from the federated German Princes.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Hepworth Collins, A.M.Inst.C.E., consulting chemist and engineer, has changed his address to 17, Nicholas-street, Manchester (care of Messrs. Edward Wihl & Co.).——Messrs. N. S Joseph, Son, & Smithem have removed to new offices, No. 83, Queen-street, Cheapside. Their new telephone number is 6,082, Bank.

"THE FLEXURE OF BEAMS."—Referring to the first article in last week's *Builder*, Messrs. Crosby Lockwood & Son ask us to mention that they are the co-publishers of the book noticed ("Experiments on the Flexure of Beams," by Albert E. Guy) with Messrs. Van Nostrand, as appears on the title-page of the book. The omission was due to an oversight. Messrs. Crosby Lockwood & Son have exclusive rights of sale in this country.

A GARDEN CITY AT HITCHIN.—The Garden City Pioneer Company have acquired an estate of about 4,000 acres adjoining the Great North-road at Hitchin, distant thirty-five miles from London, and having its nearest point at a distance of rather more than a mile from Hitchin Junction Station on the Great Northern main line, whence the branch line to Cambridge traverses the estate. It is stated that there is a good supply of labour in the neighbourhood, and that ample building material can be obtained, and at a low cost, in the district. The ground lies at an altitude of from 250 to 300 ft. above sea level, there is an ample supply of good water, and the strata consist of chalk partly overlaid with gravel. A company with a large capital will soon be formed for carrying out the scheme, and subject to a cumulative maximum dividend of 5 per cent. per annum paid to the shareholders, the balance of the profits will be devoted to the benefit of the town and its inhabitants.

EXTENSION OF THE PATENT OFFICE BUILDINGS.—On August 14 the Royal Assent was given to the Bill promoted by the Commissioners of H.M. Works and Public Buildings for a further enlargement of the Patent Office buildings in Southampton-buildings. The Act provides for the acquisition of certain houses, premises, and lands upon the area which is bounded on the east side by Furnival-street, on the west side by the existing Patent Office and the garden of Staple Inn, on the south side by No. 13, Furnival-street, and Nos. 1 and 2, Took's-court, and on the north side by No. 6, Furnival-street, and a portion of Staple Inn. Some of the scheduled land consists of garden ground at the rear of Furnival-street (west side), and the new buildings will form an extension towards that street of the block that faces the terrace and garden of Staple Inn. Additional accommodation is required for an increasing executive staff, the scope of whose duties is considerably enlarged by recent legislation. As a temporary expedient several suites of offices have been rented in the adjacent chambers which form part of the new Birkbeck Bank. The block on the north Side of Quality-court, Chancery-lane, adjoining the sale of Specifications department, is also being rebuilt for official purposes. The premises recently demolished in Quality-court formed the last remaining portion of the old offices as originally designed, after the Classic style, by Sir William Chambers, and was the last building erected from his designs in London during his lifetime. The elevation in the court comprised a Roman Doric order with four fluted engaged columns and an angle-pediment standing upon a rusticated base, constructed of Portland stone.

BRITISH RAINFALL.—The British Rainfall Organisation, founded in 1860 by the late G. H. Symons, will henceforth be carried on under the sole charge of Dr. H. R. Mill, as Mr. Sowerby Wallis has been compelled by ill-health to retire after more than thirty years' connexion with the Association.

CEMENT NOTES.—Mr. Baldwin, H.M. Acting Consul at Lourenço Marques, writes that Germany and Belgium have obtained a strong hold on the cement trade there, and, as the article costs 100 per cent. of its value to import, competition is principally influenced by freights. These, for various reasons, have not been particularly favourable to the British manufacturer during the past year. The greatest rival to the British article is Alsen's (German) Portland cement, and this firm enjoys peculiar advantages by being connected with the principal German shipping line running to Delagoa Bay. A rough calculation shows that the value of a shipment of 2,000 barrels of Alsen's was 11,740 marks, and that the cost of freight, insurance, &c., to Delagoa Bay was 10,035 marks, making a total of 21,775 marks, equivalent in sterling at the current rate of exchange to 1,062*l.* 10s. (price per barrel, say, 10s. 9d.). The packing of the German cement is said to be better than that of the British, and there is consequently less wastage.——From Portland, Oregon, U.S., Mr. Consul Laidlaw reports that much cement is being used for building purposes and streets, but British has been out of the market for some years, being replaced by Belgian and German, at an average price of 10s. per cask for artificial and 9s. for natural. Cement is superseding wood as material for footpaths.——H.M. Consul at St. Petersburg observes that in his district Russian cement satisfies nearly all local requirements, there being even over-production, and that some of it is of good quality.

CENTRAL LIBRARY, BARRY, GLAMORGANSHIRE.—The Barry Public Libraries Committee met recently, when a letter was read from Mr. Andrew Carnegie declining to contribute an additional amount towards the cost of the proposed central library and reading-room at Barry. The committee had a consultation with Messrs. Hutchinson & Payne, of London, the architects, and reductions in the estimates were decided upon in order to bring the cost of the building within the amount of 8,000*l.*, which Mr. Carnegie has given.

CAERWENT EXPLORATION.—Work continues to be carried out in the excavation of Roman remains at Caerwent, near Newport, Mon. The most important features recently brought to light are some Roman houses near the schools, with a later house overlaying one of them. This later house includes a small subterranean chamber, or cellar, built largely of Roman materials. The line of pipes which was traced near the North Gate was again discovered in this field, with the addition of a small concrete culvert, and some portions of streets have been discovered. Subscriptions are invited for the continuance of the work. The hon. Secretary of the Committee is Mr. A. T. Martin, of Bath College, Bath.

THE HOLBORN-TO-STRAND IMPROVEMENT.—Sir John Wolfe Barry has issued his award as umpire in the arbitration which has recently been held to determine the amount to be paid by the London County Council to the Metropolitan Electric Supply Co., Ltd., for the compulsory acquisition by the Council of the company's generating works at Sardinia-street, Lincoln's Inn-fields. The amount of the award is 183,150*l.*

VENEZUELAN ASPHALT.—According to a Report received at the Foreign Office from the British Consul, a new article of export from Venezuela during the past year was asphalt. It is very probable, the Consul thinks, that export of this produce will be very important in the future. The asphalt comes from a series of mines (or lakes) situated on the shores of Lake Maracaibo. The concession is being worked by an American company, who, during the last six months of 1902, shipped about 3,355 tons. A railway from the mines to the shore of the lake has been built, and it is hoped that very soon about 2,000 tons of crude and refined asphaltum will be exported monthly.

PATENTS AND DESIGNS AND THE ST. LOUIS EXHIBITION, 1904.—An Order in Council which has just been made declares that certain provisions of the Patents, Designs, and Trade Marks Acts of 1883-6 shall *pro tanto* apply to the International Exhibition to be held at St. Louis, U.S.A., next year. Section 39 of the Act of 1883 safeguards the right of an inventor or his legal personal representative to apply for and obtain letters patent, and to that extent assures the validity of the patent so granted, notwithstanding the circumstance that the invention may have been exhibited at an industrial or international exhibition, certified as being such by the Board of Trade, or published by means of a description of it during the period the exhibition is held, or used for purposes of the exhibition or during the holding thereof by any person elsewhere without the inventor's privity or consent. Section 57 of the Act contains similar provisoes in respect of the rights of proprietors of designs. In the case of both patents and designs alike the protection under the Act is secured only if the exhibitor gives previous notice of his intention to do so, and if the application for either letters patent or registration is made before or within six months from the date of the opening of the exhibition. A clause of the amending Act of 1886 empowers the King to declare by Order in Council that the Act of 1883 shall apply to any exhibition mentioned in the Order, as though it were an industrial or international exhibition, so certified by the Board of Trade; and, further, to relieve the exhibitor from the obligation to give the previous notice of his intention to exhibit the invention or design, or any article to which a design is applied.

THE GRAMMAR SCHOOL, LINCOLN.—Steps are about to be taken for the erection of new buildings for the grammar school. The present school premises in Lindum-terrace were built in 1884 after designs by Mr. W. Watkins. The school, founded in the latter half of the sixteenth century, was, in 1583, amalgamated with the Cathedral School, then in the Close, and then, having been endowed with a scholarships' fund by Sir Christopher Wray, Chief Justice of the King's Bench in 1574-1603, and his wife, was united with the Jersey School of the Corporation. Twenty years ago the Charity Commissioners made a scheme for dividing the foundations into the Grammar and Middle Schools, assigning to the former a capital sum of 10,000*l* paid by the Ecclesiastical Commissioners and a yearly subsidy of 300*l.* paid by the Dean and Chapter of the Cathedral. Thereupon the Grammar School vacated, in favour of the Middle School, their old quarters in Broadgate, which had belonged to the Franciscan Friars established there in the thirteenth century by William de Beningworth, and which the Corporation bought in 1574 from Justice Monson, of the Common Pleas.

THE SALE OF CITY CHURCHES.—A return just issued by the Home Office sets forth that during the period August 2, 1894—December 31, 1902, four City churches were demolished, and that the sums realised by the sale of three of the sites were—for St. Michael, Wood-street, 31,617*l.* 4s. 9d., less 670*l.* 9s. 7d. for "charges"; for St. Michael Bassishaw, 36,014*l.* 17s. 2d., less 773*l.* 6s. 9d. for "charges"; and for St. Bartholomew, Moor-lane, 20,420*l.*, less 302*l.* for "charges." The site of St. George, Botolph-lane, is not yet disposed of. Out of those several amounts certain appropriations have been made thus:—St. Bartholomew, Moor-lane, 2 000*l.* to providing a parsonage-house for a new church at Stamford Hill, with 4 252*l.* 4s. 6d., as part of the ex-incumbent's pension and for use upon other objects after his decease. St. Michael Bassishaw, 10,000*l.* to the new church at Edmonton, and 2,000*l.* to the parsonage-house there; 4,000*l.* to a parsonage-house for the united benefice of St. Lawrence Jewry with other parishes; 12,000*l.* towards the building of the Church of St. Aldhelm, Edmonton, and the completion of the Church of St. Peter, Lower Edmonton; 4,000*l.* transferred to the Union of Benefices Fund in respect of the cost (2,444*l.* 2s.) of the removal of human remains, and 500*l.* to improvements at St. Lawrence Jewry. St. Michael, Wood-street, 14,783*l.* 15s. 6d. to the new Church of St. Andrew and St. Michael, East Greenwich, and its parsonage-house; 2,000*l.* to the Union of Benefices Fund; 4,000*l.* to a parsonage-house for the united benefice of St. Alban, Wood-street, St. Michael, Wood-street, with other amalgamated parishes; 1,000*l.* to improvements at St. Alban, Wood-street; 5 043*l.* 15s. to the purchase of India Three per Cent. Stock to yield an income of 150*l.* a year for the incumbent of St. Andrew and St. Michael, East Greenwich; and 600*l.* to the maintenance of the disused burial grounds of St. Olave, Silver-street, and St. Mary Staining. The return also specifies how the parochial endowments of the three parishes concerned have been severally applied. In the case of St. Bartholomew, Moor-lane, they are annexed partly to St. Giles, Cripplegate Without, as the mother church of the two newly united parishes, and partly to the ex-incumbent's pension, with a reversion in favour of the new benefice at Stamford Hill and in the cases of St. Michael Bassishaw and St. Michael, Wood-street, to the united benefices respectively, and to kindred purposes in connexion with the new churches and their endowments.

PAVING AND TRAMWAYS IN MOSCOW.—According to a recent report on this subject, the streets of Moscow are in the following condition:—The total area of roadway is 2,200,000 square sajens (1 sajen equals 7 ft.) Of these 500,000 sajens are totally unpaved; 500,000 have not been repaved since the town took over the roadways in 1875; and the remaining 1,200,000 have a pavement of cobbles which is unsatisfactory, both from a technical and sanitary point of view, and is also badly kept up. To pave the streets that have not yet any pavings, and in general to lay down an improved roadway, would, it is estimated, cost not less than 3,125,000*l.* The Town Council has for the present decided to put down a certain amount of improved paving, probably an area of about 460,000 square sajens. This will be wood on the level parts and squared stone on the slopes. It is proposed to employ pine blocks and Swedish granite. The Town Council have also adopted a scheme for the extension and electrification of the tramway system. It is to be divided into five sections, each section to be constructed in a year. The first three years will be employed in converting the present tramway system into an electric service, and the remaining two years in constructing additional electric lines. The total length of liner will be about 125 miles. The trolley

system has been adopted, and the probable cost will not be less than 4,200,000*l.*

DANTZIG TIMBER TRADE.—It is stated in an official report on the trade and commerce of Dantzig for the year 1902, that supplies of all kinds of wood from Russia were greatly impeded by the difficulty experienced by the owners of the forests there in obtaining advances from the banks to allow of their felling and floating the timber down to the shippers. In addition to this, Dantzig's best customers showed no anxiety to buy largely. The trade with the United Kingdom felt the effects of the war in South Africa. Belgian industries were far from flourishing, and there was no desire to increase stocks. France preferred using wood from the French forests in the Vosges and Pyrenees. The demand from Berlin was larger than ever on account of the activity in the building trade. The low freights which continued from the year 1901 were in favour of shippers, and the diminished arrivals from the forests kept the prices up to a remunerative point. Of the 242,000 tons of wood exported from Dantzig in 1902, 116,714 tons were shipped to the United Kingdom, as against 120,134 tons out of 223,000 tons in 1901. The British steamers that go to Dantzig to load timber are said to be so loosely drawn that before they have been there many hours they come into conflict with the custom of the port in regard to taking in cargo. It is the custom for the master to give a receipt for the full number of pieces of wood as soon as they are brought alongside in rafts. When bulk is broken to haul the timber on board all the water-logged portion of the raft sinks to the bottom of the river. The master, knowing that his ship will have to make good the deficiency on discharging in the United Kingdom, notes a protest. The shippers, on the other hand, decline to recognise the protest on the plea that they hold the master's receipt for the whole quantity. The decline of the trade during the last five years is indicated by the following figures of the timber that was either floated down the River Vistula or reached Dantzig by railway :—

Year.	Quantity. cubic metres.	Value. £
1902	273,567	443,680
1901	446,859	661,955
1900	429,159	637,830
1899	717,160	1,093,900
1898	665,055	1,010,975

CAPITAL AND LABOUR.

SUNDERLAND JOINERS.—A meeting of the Northern centre of the Building Trades Employers was held at Leeds on the 26th ult. A deputation of the Amalgamated and Associated Societies of Carpenters and Joiners attended by invitation and discussed fully the position of the Sunderland house joiners' strike and the proposed lock-out over the Northern Counties Federation. The operative societies requested that the lock-out should be postponed from the 29th inst. until a fortnight later, in order that the operatives might take a ballot of their members throughout the area affected by the proposed lock-out. The operatives agreed to report the result of their ballot to the Northern Centre before the expiration of next week. The Northern Centre of the Building Trade Employers agreed to this proposition. —It is stated that the Sunderland joiners are going on with their scheme for establishing workshops in the town. The joiners have modified their ideas respecting the raising of the capital, and the present proposition is to raise 1,000*l.* by 2*l.* shares. Every member of the society, shareholder or not, will be given employment if there should be sufficient work. If there is not sufficient work for all each man will be allowed to work every other week.

PATENTS OF THE WEEK:

APPLICATIONS PUBLISHED.*

21,518 of 1902.—T. W. RHODES and F. R.C. RHODES: *Sliding Window Sashes.*

In sliding window sashes, the combination of a metallic chain attached to the stile of the sash and running over a chain wheel mounted in a metallic frame screwed to the sash frame, with the end of the chain attached to the sash-weight.

4,159 of 1903.—R. G. W. EATON: *Metallic Window Frame.*

According to this invention, the joining of lengths of metallic window-framing is made by means of tongues or tenons at the ends of two short lengths of framing, passing through a slotted hole in a long length of framing, as many slotted holes being made as the number of windows to be formed required.

10,087 of 1903.—J. T. C. TENNANT and L. TENNANT: *Window Sashes and Framings.*

This relates to window sashes, window frames, and their fittings, and consists in the formation of grooves or slides in or on the said frames, in which, pins or studs fixed to the sashes are free to slide said grooves having slots or outlets through which the pins can be passed so as to permit of revolving or turning over the sashes for cleaning or ventilating purposes, the upper of the said sashes having a rack on each side in which cogs fixed to the lower sash, and having ratchets each controlled by a pawl, are free to run when the said ratchets are released so that the sashes can be moved up and down.

12,749 of 1903.—E. R. WOOD: *Appliances for Holding Doors, Windows, and the like.*

An appliance for holding doors, windows, and the like in any desired position, consisting of or comprising a hinged pawl, or arm, fastened to and supported from the door, window, or the like, and having its end adapted to engage with the ground or floor, when free.

14,348 of 1903.—F. SPRING: *Chimney-cowls.*

A chimney-cowl, comprising in combination a base-plate with a central opening, a conical flange surrounding said central opening, four vertical supports at the corners of said base-plate, inclined guide plates curved longitudinally and fixed between the vertical supports so that their upper edges project into the inner space of the cowl, and a head-piece with a central opening.

15,365 of 1902.—A. J. BOULT (C. CAVEGLIA): *Cement Floors, Plates, or Structures.*

A reinforced cement floor, plate, or structure adapted to withstand simple bending stresses, or tension or compression as well as bending stresses, formed of concrete or mortar with uniform reinforcing metallic bars arranged remote from the neutral line, the bars extending wholly, or partly, across the structure, and being entirely unconnected one with the other and so arranged as to strengthen the structure at its weakest points.

17,738 of 1902.—G. L. MOUCHEL: *Caissons, Foundation or Building Cylinders, Columns, Piles, Bridge Abutments, Wharves, Piers, Sea Walls, Quay Walls, Dock Walls, and like Structures.*

The combination of a pile which penetrates the ground, a casing which encircles the pile, a hearting between the pile and casing, a row of sheet piles disposed between the said casing, a filling behind the sheet piles, and struts between the casing and the sheet piles.

21,273 of 1902.—D. M. NESBIT AND W. CLOWES: *Steam Heating Systems and the Like.*

In steam heating systems collecting the water and steam escaping from the various traps on the system in such a manner that the same may be utilised as feed water or for other useful purposes.

27,187 of 1902.—O. RUHL: *Strengthened or Armoured Concrete, or Other Slabs.*

Armoured concrete or other slabs, characterised by the employment of metal strengthening pieces, which after having passed through the portions in which the tension is exerted at the supports and at the middle of the slabs, form, between these two spots (either directly or indirectly by the projection of the cross section of the ceiling), a rectangular trapezoidal or other figure, both the upper half as well as the lower half being strengthened by this means whilst allowing the point at which the bending moments become nil to change place, inside the said rectangular figures having a trapezoidal or equivalent form without the slabs being exposed to danger resulting from the formation of cracks.

6,960 of 1903.—T. WITHEY: *Fire Escape.*

A fire escape, consisting of a tube extending from the top to the bottom of a building to which it is attached, the said tube being partly filled with oil, and having a balance-weight resting in its lower end, a wire cord being attached to said weight and passing up the tube through guide blocks and over pulleys to and through a horizontal branch tube, the said cord passing out through a nipple at the end of the latter, and being connected to a chain extending down the front of the building, a sling or cradle being hooked to the chain for permitting the descent of occupants of the building from any of the floors of the same.

14,824 of 1903.—S. H. JACOBSON: *Ventilators.*

In a ventilator a casing covering, an opening communicating with the space to be ventilated, and having its ends open, a series of pivoted deflecting blades therein, and movable means, automatically thrown into operation when a change takes place at the point of entrance of the air current to said casing.

14,943 of 1903.—C. MEINECKE: *Apparatus for Painting, Varnishing, and the like of Floors and other Surfaces.*

An apparatus for painting, varnishing, and the like of floors and other surfaces, comprising in combination, a liquid receptacle to be moved to and fro by means of a handle; brushes inserted in suitable sockets of the receptacle; means for supplying the liquid from the receptacle through the brush head and laterally of same; and means for closing the supply openings of the liquid receptacle when the apparatus is not required for use.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

MEETINGS.

SATURDAY, SEPTEMBER 5.

Association of Managers of Sewage Disposal Works—Meeting at Leeds. Mr. W. D. Scott-Moncrieff in the chair.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

August 18.—By HATCH, WATERMAN, & SON (at Ashford).

Wye, Kent.—The Wye Water Mill, f.	£800
Great Horton Field, 6 a. 1 r. 5 p., f.	460
Sheldwich, Kent.—Enclosures of arable and woodland, 16 a. 0 r. 3 p., f.	300
Chilham, Kent.—Danshurst Cottage, f., y.r. 26*l.*	280
Enclosure of orchard or building land, 1 a. 2 r. 38 p., f.	480
Freehold cottage and garden	185

August 19.—By COOK & BIRMINGHAM (at Dulverton).

Exton, Somerset.—Witheridge and South Huckham Estate, 262 a., f., w.r. 160*l.*	2,760
Widlake and Loggetts Estate (otherwise Locketts), 217 a., f., y.r. 198*l.*	2,525
Accommodation holding and cottage (Loggetts), 4 a., f., y.r. 15*l.*	400
Part of Quarme Wood, 4 a. 1 r. 21 p., f.	100
Part of Leys, or Coppleham, 2¼ a., f.	100

August 20.—By THORNBORROW & Co. (at Penrith).

Penrith, Cumberland.—Friar-st., freehold house and stable	265
Four enclosures of arable, 16 a. 1 r. 26 p., f.	810
1 to 10, Poplar-pl., f., y.r. 113*l.*	1,885
Grub-st., six freehold cottages	380
Freehold house and cottage, y.r. 34*l.* 4*s.*	320
Melbourne House, Melbourne Cottage and Enclosures, 75 a. 3 r. 29 p., f.	4,700
Fowler Syke Cottage and meadow, 1 a. 1 r. 32 p., f.	275
Fell-la., three freehold closes of pasture	1,100
Bishops Yard, freehold printing works and three dwellings	2,660
Dacre, Cumberland. — Zerubbabel-pl. and close of land, 8 a. 1 r. 19 p., f.	725

By RICHARD AUSTIN & WYATT (at Meonstoke).

Meonstoke, Hants.—Watton-la., The Waddens and 93 a. 1 r. 9 p., f., y.r. 55*l.*	1,170
Harvestgate Farm, 167 a. 2 r. 38 p., f., y.r. 110*l.*	1,970
Hill House and 2 r. 4 p., f.	310

August 21.—By PROTHEROE & MORRIS (on Estate).

Newhaven, Sussex.—Mount Pleasant Estate, 63 freehold plots; also Denton Barn and four cottages (in lots)	1,627

August 22.—By THORNBORROW & Co. (at Keswick).

Borrowdale, Cumberland.—Stonethwaite, freehold grazing farm, 437 a.	2,100

August 25.—By THORNBORROW & Co (at Penrith).

Penrith, Cumberland.—Carlton Hill, several closes of meadow and pasture land, 29 a. 0 r. 33 p., f.	1,075
Townhead, eight closes of pasture, meadow, and arable lond, 19 a. 3 r. 26 p., f.	1,045

By E. G. RIGHTON (at Stratford-on-Avon).

Alveston, Warwick.—Tiddington, freehold farm, 210 a. 0 r. 25 p., p.	6,920

August 26.—ROBERT TIDEY & SON.

Stoke Newington.—8 and 10, Millard-rd., u.t. 69 yrs., g.r. 11*l.*, y.r. 59*l.*	66

JAMES ELEY (at Boston).

Boston, Lincs.—Royal Oak Hotel, f., y.r., 120*l.* ..	2,200
Butterwick, Lincs.—Close of arable, 3 a. 0 r. 39 p., f.	163
Thornton-le-Fen, Lincs.—Freehold farm, 10 a. 1 r. 27 p.	360

FRITH, GARLAND, & Co. (at Harringay).

Harringay.—141, Wightman-rd., u.t. 84 yrs., g.r. 7*l.*, e.r. 40*l.*	420
95, Duckett-rd., u.t. 92 yrs., g.r. 7*l.*, e.r. 38*l.* ..	350

A. G. & A. NOTLEY (at Lowestoft).

Kirkley, Suffolk.—Acton Estate, 243 freehold building plots (in lots)	1,701
White House Farm, 39 a. 1 r. 21 p., f.	1,350

August 27.—By EDWIN ROBINSON & Co.

Limehouse.—2, Turners-rd., u.t. 60 yrs., g.r. 5*l.*, y.r. 63*l.*	350

By STIMSON & SONS.

Balham.—5, Shipka-rd., u.t. 73½ yrs., g.r. 7*l.*, e.r. 34*l.*	380
Forest Hill.—20, 21, and 22, Wynell-rd., u.t. 60 yrs., g.r. 22*l.* 10*s.*, y.r. 90*l.*	580
Norwood.—121, Auckland-rd., u.t. 59½ yrs., g.r. 10*l.*, p.	800
New Kent-road.—14, Gurney-st., u.t. 63 yrs., g.r. 8*l.*, y.r. 48*l.*	430
Old Kent-road.—46, Marlborough-rd., f., y.r. 48*l.* 2*s.*	540
Putney.—43, Oakhill-rd., u.t. 87 yrs., g.r. 7*l.*, e.r. 42*l.*	410
Thornton Heath.—4, 5, 6, 7, 8, and 10, Kimberley-ter., u.t. 96 yrs., g.r. 31*l.* 10*s.*, y.r. 163*l.* 16*s.* ..	1,100

By R. J. STEEL (at Kew Bridge).

Hounslow, Middlesex.—1, 2, 3, and 4, Magdala-cottages, f., w.r. 83*l.* 4*s.*	950
Putney.—14 and 16, Pentlow-st., u.t. 59½ yrs., g.r. 7*l.*, w.r. 65*l.*	430

August 28.—By A. J. SHEFFIELD.

Edmonton.—137, 139, and 141, Fore-st., u.t. 53½ yrs., g.r. 24*l.*, y.r. 180*l.*	1,800
Poplar.—19 and 19a, Wilson-st. (wheelwright's premises), u.t. 35½ yrs., g.r. 17*l.*, y. and e.r. 100*l.*	430
Bromley-by-Bow.—43, Ellesmere-st., s., u.t. 58 yrs., g.r. 2*l.*, w.r. 39*l.*	270

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.			
Hard Stocks	1 15 6	per 1,000 alongside, in river.		
Rough Stocks and Grizzles.....	1 12 6	,,	,,	,,
Facing Stocks....	2 12 0	,,	,,	,,
Shippers	2 5 0	,,	,,	,,
Flettons	1 8 6	,,	at railway depôt	
Red Wire Cuts ..	1 12 6	,,	,,	,,
Best Fareham Red	3 12 0	,,	,,	,,
Best Red Pressed Ruabon Facing	3 0 0	,,	,,	,,
Best Blue Pressed Staffordshire ..	4 5 0	,,	,,	,,
Do. Bullnose	4 11 0	,,	,,	,,
Best Stourbridge Fire Bricks	4 8 0	,,	,,	,,
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,,	,,
Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats.....	17 0 0	,,	,,	,,
Double Stretchers	19 0 0	,,	,,	,,
Double Headers..	16 0 0	,,	,,	,,
One Side and two Ends.....	19 0 0	,,	,,	,,
Two Sides and one End	20 0 0	,,	,,	,,
Splays, Chamfered, Squints.....	20 0 0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats.....	14 0 0	,,	,,	,,
Double Stretchers	15 0 0	,,	,,	,,
Double Headers..	14 0 0	,,	,,	,,
One Side and two Ends.....	15 0 0	,,	,,	,,
Two Sides and one End	15 0 0	,,	,,	,,
Splays Chamfered, Squints.....	14 0 0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	8 0 0	,,	less than best.	

	s. d.	
Thames and Pit Sand	6	0 per yard, delivered.
Thames Ballast	6	0 ,, ,,
Best Portland Cement	30	0 per ton, delivered.
Best Ground Blue Lias Lime..	20	6 ,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s 0d. per yard, delivered.
Stourbridge Fire-clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depôt	1	6½ per ft. cube.
Do. do. delivered on road waggons, Nine Elms depôt	1	8½ ,, ,,
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depot, Nine Elms depot, or Pimlico Wharf	2	1 ,, ,,
White Basebed, delivered on road waggons, Paddington depot, Nine Elms depot, or Pimlico Wharf....	2	2½ ,, ,,

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld rly. depôt.
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. ,,
6 in. Rubbed two sides Ditto, Ditto	2 6	,, ,,
3 in. Sawn two sides slabs (random sizes)..	0 11½	,, ,,
2 in. to 2½ in. Sawn one side slabs (random sizes)	0 7½	,, ,,
1¼ in. to 2 in. ditto, ditto	0 6	,, ,,
Scappled random blocks	3 0	per ft. cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. sup.)	2 8	per ft. super. ,,
6 in. Rubbed two sides Ditto	—	,, ,,
3 in. sawn two sides slabs (random sizes)	1 2	,, ,,
2 in. self-faced random flags.....	0 5	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
,, ,, ,, 6 in. sawn both sides landings	2 7	deld. rly. depôt. per ft. super. deld. rly. depôt
,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	13 2 6	per 1000 or 1200 at ry. dep.
20×12 ,, ,, ,, ..	13 17 6	,, ,,
20×10 best seconds ,,	12 15 0	,, ,,
20×12 ,, ,, ,,	13 10 0	,, ,,
16×8 best ,,	7 0 0	,, ,,
20×10 best blue Portmadoc ..	12 5 0	,, ,,
16×8 best blue Portmadoc	6 5 0	,, ,,
20×10 best Eureka unfading green....	15 2 6	,, ,,

PRICES CURRENT (*Continued*).

SLATES.

in. in.	£ s. d.	
20×12 best Eureka unfading green....	17 2 6	per 1000 or 1200 at ry. dept.
18×10 ,, ,,	12 10 0	,, ,,
16×8 ,, ,,	10 5 0	,, ,,
20×10 permanent green	11 0 0	,, ,,
18×10 ,, ,,	9 5 0	,, ,,
16×8 ,, ,,	6 10 0	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	42 0	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	50 0	per 1,000 ,, ,,
Do. Ornamental Tiles	52 6	,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles.....	3 6	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	51 0	per 1,000 ,, ,,
Do. Ornamental Do.	54 6	,, ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,
Best "Rosemary" brand plain tiles	48 0	per 1,000 ,, ,,
Do. Ornamental Do.	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	15 10 0	16 10 0
Deals: best 3 by 9.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0	0 less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ..	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in. ..	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.).....	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (70 ft. average)..	3 5 0	3 15 0
JOINERS' WOOD.		
White Sea: First yellow deals,	At per standard.	
3 in. by 11 in.....	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.....	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens.....	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.....	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, ,, battens.....	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes ..	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	29 0 0	32 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Dantzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 6
Small ,, ,, ...	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	. . .
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—		
Per ft. cube	0 4 0	. .
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot.....	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched.....	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched.....	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot.....	0 11 6	0 13 6
1 in. by 7 in. white, planed and matched.....	0 12 0	0 14 0
1¼ in. by 7 in. white, planed and matched.....	0 14 6	0 16 6
¾ in. by 7 inch yellow matched and beaded or V-jointed boards	0 11 0	0 13 6
1 in. by 7 in. do. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6-in. at 6d. to 9d. per square less than 7-in.

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered. £ s. d.	Railway Vans, per ton. £ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 2 6	8 5 6

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars.....	7 10 0	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0	8 10 0
Staffordshire "Marked Bars" ..	10 10 0	. . .
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price.....	9 0 0	9 5 0
,, ,, galvanised.....	16 0 0	. .
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	9 15 0	. . .
,, ,, to 24 g.	10 15 0	. . .
,, ,, to 26 g.	12 5 0	. . .
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 15 0	. . .
,, ,, 22 g. and 24 g.	13 5 0	. . .
,, ,, 26 g.....	14 5 0	. . .
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.....	16 0 0	. . .
,, ,, 22 g. and 24 g.	16 10 0	. . .
,, ,, 26 g.....	18 0 0	. . .
Galvanised Corrugated Sheets:—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	. . .
,, ,, 22 g. and 24 g.	13 5 0	. . .
,, ,, 26 g.....	14 0 0	. . .
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	11 15 0	. . .
,, ,, 22 g. and 24 g.	12 15 0	. . .
,, ,, 26 g.	14 0 0	. . .
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	. . .
Pipe in coils	14 10 0	. . .
Soil pipe	17 0 0	. . .
Compo Pipe	17 0 0	. . .
ZINC—Sheet—		
Vieille Montagne ..... ton	26 0 0	. . .
Silesian	25 15 0	. . .
COPPER—		
Strong Sheet ..... per lb.	0 0 10½	. . .
Thin ..... ,,	0 0 11½	. . .
Copper nails ..... ,,	0 0 11	. . .
BRASS—		
Strong Sheet..... per lb.	0 0 10	. . .
Thin ,, ... ,,	0 0 11	. . .
TIN—English Ingots ..... ,,	0 1 4	. . .
SOLDER—Plumbers' ..... ,,	0 0 6	. . .
Tinmen's ..... ,,	0 0 8	. . .
Blowpipe ..... ,,	0 0 9	. . .

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths.....	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths.....	3½d. ,, ,,
26 oz. thirds	3¾d. ,, ,,
,, fourths.....	3¾d. ,, ,,
32 oz. thirds	4¼d. ,, ,,
,, fourths.....	4½d. ,, ,,
Fluted sheet, 15 oz.	2¼d. ,, ,,
,, 21 oz.	3¼d. ,, ,,
½ Hartley's Rolled Plate	1¾d. ,, ,,
⅝ ,, ,, ,, ...	2d. ,, ,,
¾ ,, ,, ,, ...	2¼d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels..	per gallon	0 1 10
,, ,, ,, in drums.....	,,	0 2 2
Boiled ,, ,, in pipes or barrels..	,,	0 2 1
,, ,, ,, in drums.....	,,	0 2 5
Turpentine, in barrels	,,	0 3 7
,, in drums	,,	0 3 9
Genuine Ground English White Lead	per ton	19 10 0
Red Lead, Dry	,,	19 10 0
Best Linseed Oil Putty.....	per cwt.	0 2 0
Stockholm Tar.....	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak.....	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for Seats of Churches.....	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 3 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Designs for a Free Public Library	Borough of Tamworth	20*l.*, 10*l.*, 5*l.*	Nov. 14
*Additions and Alterations to Town Hall	Sunderland Corporation	100*l.*, 50*l.*, 25*l.*	Nov. 21

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., supplied by	Tenders to be delivered
*Extension and Refitting of Oxford Circus Convenience	M. B. St. Marylebone	Borough Engineer, Town Hall, Marylebone-lane, Oxford-street, W.	Sep. 4
*Ward, Isolation Blocks, &c., at Isolation Hosp., Watford	Watford Isolation Hospital Board	C. P. Ayres, Binvale, Watford	Sep. 8
Boundary Walls, &c., Corporation-yard	Colchester Corporation	H. Goodyear, Civil Engineer, Town Hall, Colchester	do.
Sewerage Works, Back King-street and others	Church (Lancs) U.D.C.	W. E. Wood, Surveyor, Council Offices, Church	do.
Ice Factory, Scarborough	Ice and Cold Storage Co., Ltd.	Freeman & Co., Architects, 11, Carr-lane, Hull	do.
Cricket Pavilion, Hampden Park	Eastbourne Corporation	D. J. Bowe, Borough Surveyor, Town Hall, Eastbourne	do.
Tar Paving	Southampton Corporation	J. A. Crowther, Borough Engineer, Southampton	do.
Sewerage Works	Dursley (Glos.) R.D.C.	V. A. Lawson, Civil Engineer, 17, Rowcroft, Stroud	Sep. 9
Sewers, &c., Green-lane	Walsall Corporation	J. R. Cooper, Borough Offices, Walsall	do.
Sewers, &c.	Ripon R.D.C.	H. A. Johnson, Civil Engineer, 15, The Exchange, Bradford	do.
Sewerage Works	Ryton-on-Tyne U.D.C.	J. P. Dalton, Surveyor, Ryton	do.
Water Mains, Millbrook Building Estate	St. Germans R.D.C.	F. W. Cleverton, 4, Buckland-terrace, Plymouth	do.
Refuse Destructor	Ossett (Yorks) Corporation	W. Emmott, Civil Engineer, 35, Commercial-road, Hailfax	do.
House, South-street, Egremont, Cumberland	Mr. G. Rigg	J. Cowan, Surveyor, Egremont	do.
Stabling, Sunnybank	Weymouth U.D.C.	W. B. Morgan, Engineer, Melcombe Regis	do.
Additions to Richmond Lodge, Wavertree	Toxteth Park Guardians	W. Thomas & Co., Architects, 15, Lord-street, Liverpool	do.
Vestry at Chapel, Cross Inn, Llangathen	.....	D. Jenkins, Architect, Llandilo	do.
Shop, Pontmorlais, Merthyr, Wales	.....	C. M. Davies, Architect, 112, High-street, Merthyr	Sep. 10
Stabling at Chambers Farm, Brigsteer, nr. Cambridge	.....	J. Banks, Kendal	do.
Paving Works, Pedley and other streets	Crewe (Cheshire) Town Council	G. Eaton-Shore, Borough Surveyor, Crewe	do.
Shop and Hall, Westfield, Workington	Beehive Co-operative Society, Ltd.	W. G. Scott & Co., Architects, Victoria Buildings, Workington	do.
Cottages, Tullyskeharney (Ireland)	Manorhamilton R.D.C.	P. Keany, Workhouse, Manorhamilton	do.
Bridge, Glanyrafon, Rhostyllen	Wrexham R.D.C.	T. R. Evans, Surveyor, Johnstown, Ruabon	do.
Bridge Works, Southside, Longparish	Andover R.D.C.	J. Wormald, Surveyor, The South Cottage, Andover	do.
Sewers, &c., Lane End	Pudsey (Yorks) Corporation	J. Jones, Borough Surveyor, Church-lane, Pudsey	do.
Fifty-two Houses, Frystone, near Castleford (Yorks)	Wheldale Colliery Co., Ltd.	Garside & Pennington, Architects, Castleford	do.
Retaining Wall, Bordesley, near Birmingham	Great Western Railway Company	G. K. Mills, Paddington Station, S.W.	do.
Lodge at Cemetery	Hastings Corporation	P. H. Palmer, Civil Engineer, Town Hall, Hastings	Sep. 11
Road Works, Maridon	Totnes (Devon) R.D.C.	S. S. Rendle, Surveyor, Hillside Paignton	do.
Electricity Plant	Stoke-on-Trent Corporation	J. B. Ashwell, Town Hall, Stoke-on-Trent	do.
Paving Works, Delaware and other roads	Preston (Lancs) Corporation	Borough Surveyor, Town Hall, Preston	do.
Alterations to Premises, Ogmore Vale	Nantymoel Industrial Co-op. Soc.	J. Morgan, Nantymoel	do.
Two Houses, Hartwell, near Aylesbury	.....	F. Taylor, Architect, 26, Temple-street, Aylesbury	Sep. 12
Works at 3 Houses, Pier-road, Berwick-on-Tweed	.....	J. M. Edney & Co., Sandgate	do.
Iron Fencing, West Mersea, Sussex	Lexden R.D.C.	J. Ennals, Surveyor, Copford	do.
Road Works, Caldecott Park	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, Rugby	do.
Setts and Kerbs	Selby U.D.C.	Bruce Gray, Civil Engineer, Town Hall, Selby	do.
Road Metal	Winchester Corporation	W. J. Taylor, County Surveyor, The Castle, Winchester	do.
Sewerage Works, Lund-road	Ulverston U.D.C.	Surveyor, Theatre-street, Ulverston	do.
Sewers, &c., West-street	Worsbrough (Yorks) U.D.C.	J. Whitaker, Surveyor, Worsbrough Bridge	do.
Repairs to Church Spire, Doncaster-road	Wakefield Corporation	City Surveyor, Town Hall, Wakefield	do.
Sewers, &c., Killough, Ireland	Downpatrick R.D.C.	R. L. Morrow, Council Offices, Downpatrick	do.
*Building Works (Extension of Electricity Works)	Croydon Borough Council	Borough Engineer, Town Hall, Croydon	Sep. 14
*Smith and Ironfounder's Work, Electricity Works	do.	do.	do.
Road Works	Stockton-on-Tees Corporation	M. H. Sykes, Borough Surveyor, Stockton	do.
Twenty Houses, Cwmfelinfach, near Ynysddu	Cwmfelin Building Club	J. Boothman, School House, Ynysddu	do.
Additions to Shops, Dundalk	G. N. R. Co. (Ireland)	Engineer, Amiens-street Terminus, Dublin	do.
Thirty-four Cottages, Wolston, near Coventry	Messrs. Blummel & Bros.	H. Chattaway, Architect, Coventry	do.
Pier Works, Aird Point, Aulthea, N.B.	.....	—. Manners, Civil Engineer, 12, Lombard-street, Inverness	do.
Additions to Electric Power Station, Macdonald-road	Edinburgh Corporation	R. Morham, City Architect, City Chambers, Edinburgh	do.
Quay Works	Pittenweem Town Council	D. and C. Stevenson, Surveyors, 85, George-street, Edinburgh	Sep. 15
Surveyor's Materials	South Shields Corporation	S. E. Burgess, Civil Engineer, South Shields	Sep. 16
Road Works	Isleworth U.D.C.	P. G. Parkman, Surveyor, Town Hall, Hounslow, W.	do.
Water Supply Works, Talgarth, Brecon	Hay R.D.C.	R. E. W. Berrington, Civil Engineer, Wolverhampton	do.
*Heating Chamber, &c., at Dundonald-road School	U.D.C. of Wimbledon	Thompson & Pomeroy, Hill-road, Wimbledon	do.
*Destructor Buildings, &c., at Sewage Farm	Epsom U.D.C.	Council's Surveyor, Bromley Hurst, Church-street, Epsom	Sep. 17
Lodge at Hospital, Clay-lane	High Wycombe R.D.C.	B. L. Reynolds, 12, Easton-street, Wycombe	do.
Sewers, &c., Coulsdon and other places	Croydon R.D.C.	R. Chart, Surveyor, Union Bank Chambers, Croydon	do.
Manual Instruction Centres	Portsmouth Corporation	A. H. Bone, Architect, Cambridge Junction, Portsmouth	Sep. 18
Market	Lancaster Corporation	J. C. Mount, Borough Surveyor, Town Hall, Lancaster	Sep. 19
Drainage Works	Harrogate Town Council	E. W. Dixon, Civil Engineer, Harrogate	do.
*New Engine House, &c., at Knowle Asylum, Fareham	County of Southampton	County Surveyor, The Castle, Winchester	Sep. 21
*Materials, &c., City of London Cemetery, Little Ilford	Corporation of London	Engineer to the Corporation, Guildhall	Sep. 22
*New Sorting Office, Muswell Hill, N.	Commissioners of H.M. Works, &c.	J. Wager, H.M. Office of Works, Storey's Gate, S.W.	do.
*Making-up Roads	Chiswick U.D.C.	Council's Surveyor, Town Hall, Chiswick, W.	Sep. 23
*Sewerage Works	Sevenoaks R.D.C.	T. Hennell, Engineer, 6, Delahay-street, Westminster, S.W.	do.
*Car Depot, Stores, Repair Shops, &c. (Electric Trams)	Swindon Corporation	Lacey & Sillar, 2, Queen Anne's Gate, S.W., and Manchester	do.
*Public Baths and Washhouses, Plumstead	Woolwich Borough Council	Borough Engineer, Maxey-road, Plumstead	Sep. 24
Walls, &c., at Cemetery	Wigan Town Council	W. B. Johnson & Son, Architects, 31, King-street, Wigan	Sep. 26
Surveyor's Materials	Sheerness U.D.C.	T. F. Berry, Surveyor, Trinity-road, Sheerness	Sep. 28
*Erection of Tenements, Stabling, &c., New Depot, &c.	Borough of Hampstead	Borough Engineer, Town Hall, Hampstead, N.W.	Sep. 30
*Underground Convenience in Falcon-square	Corporation of London	Office of the Engineer, Public Health Department, Guildhall, E.C.	Oct. 6
*Twenty Workmen's Cottages, Purfleet	Derby Corporation	V. Millett, 72, Bishopsgate-street, Within	No date.
Additions to Workhouse	Watford Guardians	C. P. Ayres, Architect, Burvale, Watford	do.
Walling, Cookridge, near Leeds	.....	Newsom & Gott, Surveyors, 3, East Parade, Leeds	do.
Schools, &c., Padiham (Lancs)	.....	T. Bell, Architect, 14, Grimshaw-street, Burnley	do.
Additions to Institute, Llanbradach	The Committee	Teather & Wilson, Architects, Queen-street, Cardiff	do.
Additions to House, Middles Farm, near Consett	.....	R. G. Moore, 5, Rosebery-terrace, Consett	do.
Club, Clitheroe	.....	J. C. Howard Sandbach, Architect, 15, Richmond-terrace, Blackburn	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Colwyn Bay and Colwyn U.D.C.	2*l.* 2*s.* per week	Sep. 8
*Clerk of Works	Derby Corporation	3*l.*	Sep. 14
*Surveyor's General Assistant	Wandsworth Borough Council	2*l.* per week	Sep. 15
*Clerk of Works	Trowbridge &c. Jnt. Isol. Hos. Com.	3*l.*	Sep. 16
*Junior Measuring Clerk	Corporation of London	200*l.*	Sep. 22
*Architectural Draughtsman	H.M. Naval Establishment, Rosyth	Not stated	No date.

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, iv. *Contracts*, iv. vi. viii. & x. *Public Appointments*, xvii.

PUBLISHER'S NOTICES.

THE INDEX (with TITLE-PAGE) for VOLUME LXXXIV. (January to June, 1903) was given as a supplement with the number for July 11.

CLOTH CASES for Binding the Numbers are now ready, price 1s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE EIGHTY-FOURTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c., &c.

Six lines, or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, and for front page, and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).

FOUR lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

**Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office*, Catherine-street, Covent Garden, W.C. *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH. By Post (carefully packed) 1s.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon &c., 20s. per annum. Remittances (payable to J. MORGAN) should be addressed to the publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers) can ensure receiving "The Builder" by *Friday Morning's Post*.

TO CORRESPONDENTS.

J. E. L.—J. B.—A. D. G.—E. & C. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is undue good, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERGAVENNY.—For additions, &c., to Corn Exchange Inn, Gilwern, for Mrs. Edwards. Mr. B. J. Francis, architect, Abergavenny:—

Thos. Morgan, Crick Lowell	£330

ABERTILLERY (Mon.)—For the erection of laundry buildings, stables, &c., for the Abertillery Steam Laundry Co., Ltd. Mr. G. C. Hillard, architect, Market-chambers, Abertillery. Quantities by the architect:—

J. Hatherley	£2,347 0 0	E. C. Jordan	£1,833 7 0
Burgoyne & Co.	2,037 0 0	D. W. Richards, Ltd., Newport*	1,852 0 0
N. Bagley	1,895 6 6		

BARKING.—For alterations at the Barking Cross Tavern, for Mrs. Holland. Mr. J. M. H. Gladwell, architect:—

Salt & Sons	£377 0 0	H. Bishop*	£268 0 0
C. North	362 10 10		

BRISTOL.—For the construction of sewers at Horfield for Messrs. Helliar and others. Messrs. Holbrow & Oaten, surveyors, 9, Clare-street, Bristol:—

W. Thomas	£171 15	T. Williams*	£130 8
G. Hedges	132 0		

BRISTOL.—For alterations to No. 392, Gloucester-road, Horfield, for Mr. E. Jenkins. Messrs. Holbrow & Oaten, architects, 9, Clare-street, Bristol:—

F. J. Slade	£148 0	W. Foster	£110 0
E. Preece	128 10	F. Brown*	103 18
C. Jennings	110 10		

BRISTOL.—For the construction of roads and sewers adjacent to Mina-road, Bristol, for Messrs. Hemmings & Cunningham. Messrs. Holbrow & Oaten, surveyors, 9, Clare-street, Bristol:—

Thatcher Bros.	£1,518 0 9
W. & J. Bennett	1,330 0 0
W. Thomas	1,177 0 11
A. Webb	1,078 18 11
G. Hedges*	1,053 0 0

BRISTOL.—For the erection of Council Schools, Wick-road, Brislington, Bristol, for the Bristol Education Committee. Messrs. Holbrow & Oaten, architects, 9, Clare-street, Bristol. Quantities by Mr. J. Maynard Froad, Baldwin-street, Bristol:—

General—T. R. Lewis	£10,035
Plumbing.—G. F. Tuckey	724

CHADWELL HEATH.—For erection of houses situate in Whalebone-lane, Chadwell Heath, Essex, for Mr. F. Flower. Mr. J. M. H. Gladwell, architect, Essex House, High-street, Stratford, E.:—

Death	£4,680	D. J. Deeks*	£3,250
E. Jones	3,370		

CHIPPING ONGAR, Essex.—For building children's homes at Chipping Ongar, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. Quantities by Mr. G. T. G. Wright, 2, Great Winchester-street, E.C.:—

Appleby & Sons	£59,835 0	Johnson & Co.	£49,877 0
Killby & Gayford	57,737 0	H. Lovatt	49,600 0
Perry Bros.	56,890 0	Chessum & Sons	49,385 0
Perry & Co., Ltd.	56,885 0	C. Gray Hill	48,930 0
Shurmur & Sons	56,781 0	Willcock & Co.	48,861 0
A. Porter	56,742 0	Wall & Co.	48,660 0
A. Monk	54,233 0	Thomas & Edge	48,320 0
B. E. Nightingale	53,150 0	Kerridge & Shaw	47,878 0
Ferguson & Co.	52,741 0	Foster & Son	47,444 0
Sheffield Bros.	50,371 0	C. Wall	47,3 0 0
F. & E. Davey	50,469 0	Lawrence & Son	46,957 0
Mallett & Wood	50,223 11	McCormick & Sons, Northampton-street, Essex-road, N.*	45,987 0
Leslie & Co., Ltd.	49,672 0	W. Wallis	45,986 0
Kirk & Randall	49,934 0		

CLEETHORPES.—For the erection of a shelter, &c., in park, for the Urban District Council. Mr. Egbert Rushton, surveyor, Poplar-road, Cleethorpes, near Grimsby:—

W. Ion	£450 0
Wade, Ltd.	410 13
C. W. Dixon, Grimsby*	406 0

CLUTTON (Somerset).—For providing and laying c.i. water mains, &c., for the Rural District Council. Mr. W. F. Bird, C.E., Midsomer Norton, near Bath. Quantities by engineer:—

Chas. Franks	£2,820 0 0	Smith & Son	£1,671 11 2
G. Summers	2,650 0 0	Hall & Roberts	1,610 0 0
Free Bros.	2 301 12 8	Collins & Co.	1,573 13 11
Smith & Marchant	1,842 13 0	Macdonald	1,540 2 5
Bevan & Sons	1,834 12 9	Rutter & Sons	1,453 12 0
Wills & Son	1,726 3 0	Woodward & Co., Gloucester*	1,442 15 10
Harvey	1,688 10 10		
Show & Sons	1,676 0 0		

COVENTRY.—For the erection of a shop and stores, Harnall-lane East, for the Perseverance Co-operative Society, Limited. Messrs. Harrison & Hattrell, architects, 23, Hertford-street, Coventry:—

W. Yardley	£1,220 0	Goode	£882 0
T. Hancox	1,025 0	R. Wootton	857 0
Hallam & Co.	967 5	C. Gray Hill	850 0
E. Harris*	899 0	[All of Coventry.]	

COVENTRY.—For the erection of six houses, King Edward's-road, for the Perseverance Co-operative Society, Limited. Messrs. Harrison & Hattrell, architects, 23, Hertford-street, Coventry:—

R. Wooton	£1,750	T. Hancox	£1,413
Goode	1,335	Hallam & Co.	1,345
C. Gray Hill	1,330	E. Harris*	1,320
W. Yardley	1,450	[All of Coventry.]	

CROYDON.—For alterations to No. 116, North-end. Mr. A. Broad, architect, 22, George street, Croydon. Quantities by the architect:—

D. W. Barker	£700	Pearson & Co.	£630
W. Potter	699	Smith & Sons, Ltd.	627
E. J. Saunders	680	Hanscomb & Smith	622
Lorden & Son	666	Bulled & Co.	527
Dawson & Son	643	Smith & Sons*	563
Akers & Co.	637		

DEVIZES.—For alterations to Town Hall, for the Corporation.—Mr. F. G. Billingham, Borough Surveyor, 15, Market-place, Devizes:—

R. R. Mullings	£932	Ash & Chivers, Devizes‡	£761
J. Chivers	825		

‡ Accepted, less £16, work in Assembly Room not to be done.

FERNDALE (Wales).—For additions to c. Strand, for Mr. C. Oliver. Mr. Edwin Jones, architect, Porth. Quantities by architect:—

I. Lewis	£428 9 9
G. Hallett, 43, Partridge-road, Cardiff*	429 10 0

GUILDFORD.—For the construction of an underground convenience, North-street, for the Corporation. Mr. C. G. Mason, C.E., Borough Engineer, Tuns Gate, Guildford:—

R. Smith	£1,293 0	Streeters & Todhunter	£1,138 16
A. & F. Gammon	1,298 0	Mitchell Bros.	1,138 0
W. G. Edward	1,237 0	Swayne & Son, Stoke-road, Guildford*	1,035
Tribe & Robinson	1,205 0		
R. Wood	1,182 0		

HARROW.—For alterations and additions to premises, High-street, for Messrs. Wright Cooper Bros. Messrs. Cowell & Shaw, architects, 49, Finsbury-pavement, E.C., and Harrow:—

H. Woodbridge	£475 0	Collins & Lee*	£461 8

ILFORD.—For alterations at the White Horse p.-h., Broadway, Ilford, for Mr. W. D. Golding. Mr. J. M. H. Gladwell, architect, Essex House, High-street, Stratford, E. Quantities by Mr. L. E. G. Colins, 31, Great St. Helen's, E.C.:—

Todd & Newman	£2,567	J. Maddison	£2,526
Harris & Hardrop	2,549	J. & H. Cocks, Ltd.	2,516

KETTERING.—For the execution of reservoir works, near Thorpe Malsor, for Kettering Urban District Council. Mr. T. Reader Smith, engineer, Market-place, Kettering:—

J. F. Price	£26,549 0 0	Hodson & Son	£20,010 2 2
Dixon & Son	23,984 2 6	S. Wood	19,685 7 6
J. H. Macdonald	22,676 1 8	W. H. Pickin	19,500 0 0
C. Chamberlain	21,564 13 9	Pethick Bros.	18,766 14 7
T. Smart	22,299 0 0	J. Moffatt	18,610 10 1
H. Ashley	22,252 4 0	G. Henson	18,600 0 0
Cooke & Co.	21,866 0 0	Jones & Son	17,354 10 4
G. Young	21,768 6 8	A. Jewell	16,850 0 0
R. Firth	21,173 9 0	W. Cunliffe	15 000 0 0
G. Bell	20,471 0 0	J. Barlow	15,800 0 0

KILMURRY.—For the erection of a shop, &c., for Mrs. J. Murphy. Mr. A. W. Barnard, C.E., Macroom:—

P. Reen	£273 0 0
J. Delaney, Macroom*	230 17 6

KING'S LYNN.—For the erection of a workhouse, Page Stair-lane, for Mr. H. J. Finch. Mr. H. Tilson, architect, Railway-road, King's Lynn:—

W. H. Brown	£382 0	Spagg & Son	£340 0
Read & Wildbur	381 0	Hardell Bros.	339 0
R. Dye	380 0	W. F. Smith	335 0
Knape	368 0	J. Medwell	325 0
R. Shanks, Chatteris	357 0	Tash, Langley, & Co.	325 0
Rennaut Bros.	349 10		

[Rest of Lynn]

KINSALE (Ireland).—For the erection of six cottages, Kilnaglery, for the Rural District Council. Mr. R. Evans, C.E.:—

For Alterations, Additions &c., to House at Kilnaglery.

M. Canty, Carrigaline*	£125
T. McDonnell, Carrigaline*	120

Building Cottage, &c., at Doonanvaig.

D. Denchy, Nohoval*	£165

LEYTON.—For combined drainage to ten houses, Lea Bridge-road, N.E., for Mrs. Saunders and adjoining owners. Mr. J. M. H. Gladwell, architect, Essex House, High-street, Stratford, E.:—

H. G. Fryer	£107 0	E. Jones*	£149 0
H. Bishop	167 10		

For Six Houses Ditto.

H. Bishop	£82 0	E. Jones*	£76 15

LLANDILOFAUR (Wales).—For the erection of a bridge near Glanamman, for the Rural District Council. Mr. Evan Jones, surveyor, Glancenen, Llandilo:—

Willie Morgan, Gwynfe ..£120—For Berrach Bridge, Glanamman.
Do. do. .. 380—For Neuadd Bridge, Garnant.

LONDON.—For proposed smithy and engineers' workshops, Wimborne-street, New North-road, Hoxton, for Mr. W. Hurst. Mr. A. W. Hudson, architect, 87, Finsbury-pavement:—

J. & W. T. Inkpen	£1,240 0 0	Lawrence & Sons	£998 0 0
S. J. Scott	1,120 0 0	Grovers & Sons	974 0 0
Hawkey & Oldman	1,032 0 0	E. H. Capon	897 2 5

LONDON.—For alterations at 31, Portland-place, for the Countess of Essex. Mr. F. W. Foster, architect, 41, Bedford-row:—

B. C. Hubble*	£1,873

LONDON.—For new staircases and entrance, with other alterations decorations, and repairs, at the Welsh Congregational Church, King's Cross. Mr. Alfred Conder, architect, Palace Chambers, Westminster:—

Henry Young	£2,787	Lascelles & Co.	£2,232
I. H. & R. Roberts	3 539	Grover & Son*	2,974

LONDON.—For foundations of Clerkenwell Police-court. Mr. J. Dixon Butler Surveyor to the Metropolitan Police, Architect. Quantities by Messrs. Thurgood, Son, & Chidgey, Charing Cross-chambers, Duke-street, Adelphi, W.C.:—

Parker	£3,664	Lawrance & Sons	£2,563
Holloway Bros.	2,748	Ashby & Horner	2,540
Mewlem & Co.	2 665	H. J. Williams	2,527
Holiday & Greenwood	2,625	F. & H. F. Higgs	2,510
Lascelles & Co.	2,627	Shurmur & Sons	2,480
Colls & Son	2,619	Clark & Bracey	2,420
Leslie & Co.	2,600	Grover & Sons	2,399
Lathey Bros.	2,603	Greenwood, Ltd.	2,268

[See also next page.

LONGTON (Staffs).—For the execution of sewage disposal works, for the Town Council. Mr. J. W. Wardle, C.E., Courthouse, Longton. Quantities by Borough Surveyor:—

Nowell & Sons	£9,974	W. Williams	£7,100
J. Byrom	9,849	S. J. Forsyth	6,995
H. P. Embrey	8,306	F. Barke, Stoke-on-Trent*	6,938
P. Dawson	7,592		

MAIDSTONE.—For Mill-street widening (west side). Mr. T. F. Bunting, Borough Surveyor, Borough Surveyor's Office, Maidstone:—

J. Coker	£1,220	3
R. Avard	983	0
Clarke & Epps	942	0
H. J. Smith	889	0
Wallis & Sons	818	0
W. T. Burrows	759	10
Barden & Head*	739	0

[Borough Surveyor's estimate, £367 3s. 4d.].

MANSFIELD.—For making up Brownlow-road, for the Corporation. Mr. R. F. Vallance, Borough Surveyor, White Hart-chambers, Mansfield:—

A. F. Houfton	£1,000	0	0	J. Greenwood	£937	0	0
H. Bennett	978	1	8	H. Ashley	929	0	0
J. Lane	969	10	0	J. Bradley	916	0	0
W. A. Vallance	939	0	0	Lane Brothers, Mansfield*	911	5	0

MANSFIELD.—For the construction of sewage disposal works, Pleasley Hill, for the Town Council. Mr. R. F. Vallance, Borough Surveyor, Mansfield:—

Vickers, Ltd.	£4,375	0	
J. Byrom	4,237	10	
J. Bradley	3,735	0	
J. Greenwood	3,697	0	
H. Ashley	3,593	0	
Firth & Co.	£3,555	5	
W. R. Unwin	3,488	13	
Lane Bros., Mansfield*	3,379	16	

MORLEY (Yorks).—For the erection of three terrace houses, St Andrew's-avenue. Messrs. Buttery & Birds, architects, Queen-street, Morley:—

Masonry.—Pearson & Ainsworth	£1,287	8	5
Joinery.—Binks & Sons	393	0	0
Plumbing.—J. W. Stakes	184	0	0
Plastering.—Ellis Firth	189	7	7
Slating.—Atkinson & Son	70	4	0

STEVENAGE.—For making up Pasils-road and Grove-road, for the Urban District Council:—

Shrouder & Matthews	£1,683	0	
Redhouse & Co.	1,088	0	
H. Williams	1,049	4	
D. Meston	997	0	
Wallace & Inns, Hitchin*	£872	0	
H. W. Catchpole (withdrawn)	809	0	

STRABANE (Ireland).—For the erection of a creamery, Dunnalong. Mr. W. Stuart, architect, Bowling-green, Strabane. Quantities by architect:—

G. Dillon	£230	J. Coulter, Strabane*	£210
Ellis	220	Brady,	

SUSSEX.—For alterations and additions to Old Lodge, Sussex, for the Countess De La Warr. Mr. F. W. Foster, architect, 41, Bedford-row, W.C.:—

Wells, Plumpton* £3,642

WILTON (Wilts).—For the execution of sewerage works for the Rural District Council. Messrs. Dutton & Blizard, C.E., 38, Silver-street, Salisbury:—

R. H. B. Neal	£13,236	G. Bell	£10,859
J. C. Trueman	12,400	A. G. Osenton	10,849
Wort & Way	12,204	M. Bridgman	10,535
Jesty & Baker	12,056	J. Riley, Cheltenham*	10,097
S. Wood	11,935	Tryhorn & Son	9,119
F. W. Trimm	11,839	Webb & Co.	8,797
Cooke & Co.	11,890		

[Engineer's estimate, £10,826.]

WIMBLEDON.—For the erection of two blocks of flats, Queen Alexandra's Home. Messrs. Ernest George & Yeates, 18, Maddox-street, W., and Mr. C. E. Lancaster Parkinson, 44, Bedford-row, W.C., architects. Quantities by Messrs. Young & Brown:—

W. Willett	£27,870	C. F. Kearley	£22,487
Martin Wells & Co.	24,199	Johnson & Co.	22,463
L. H. & R. Roberts	23,037	Simpson & Sons	22,343
Long & Sons	23,650	Carmichael	21,900
F. Britton	23,500	Tennant & Co., London*	20,819
W. J. Renshaw	22,819		
H. L. Holloway	22,518		

YSTRAD RHONDDA (Wales).—For the erection of seventeen cottages, for the Brodringallt Building Club. Mr Jas. Jenkins, surveyor, Ystrad, Rhondda:—

T. Rees	£205	10	
W. E. Willis	195	0	
T. Reynolds	£194	5	

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